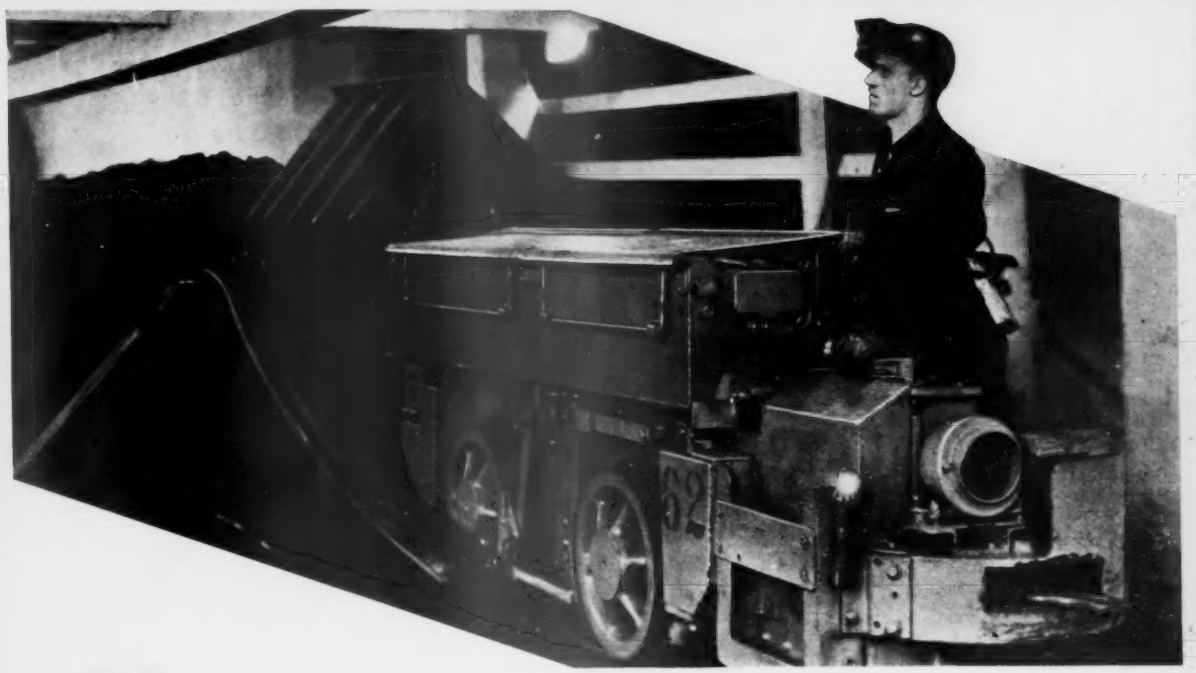
The MINING CONGRESS JOURNAL



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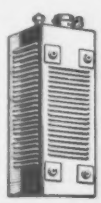

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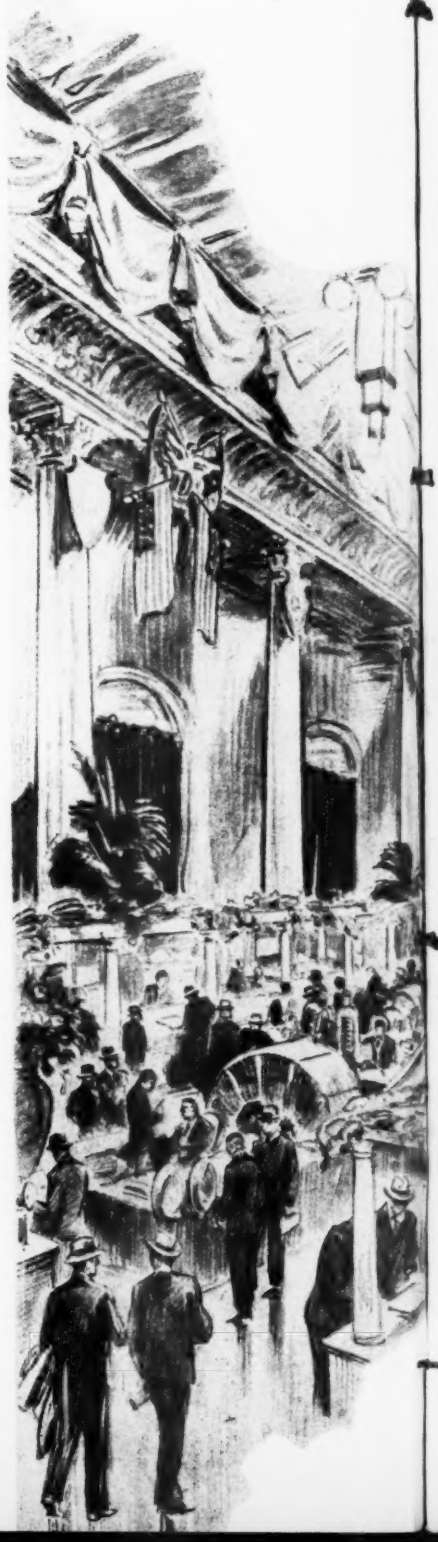

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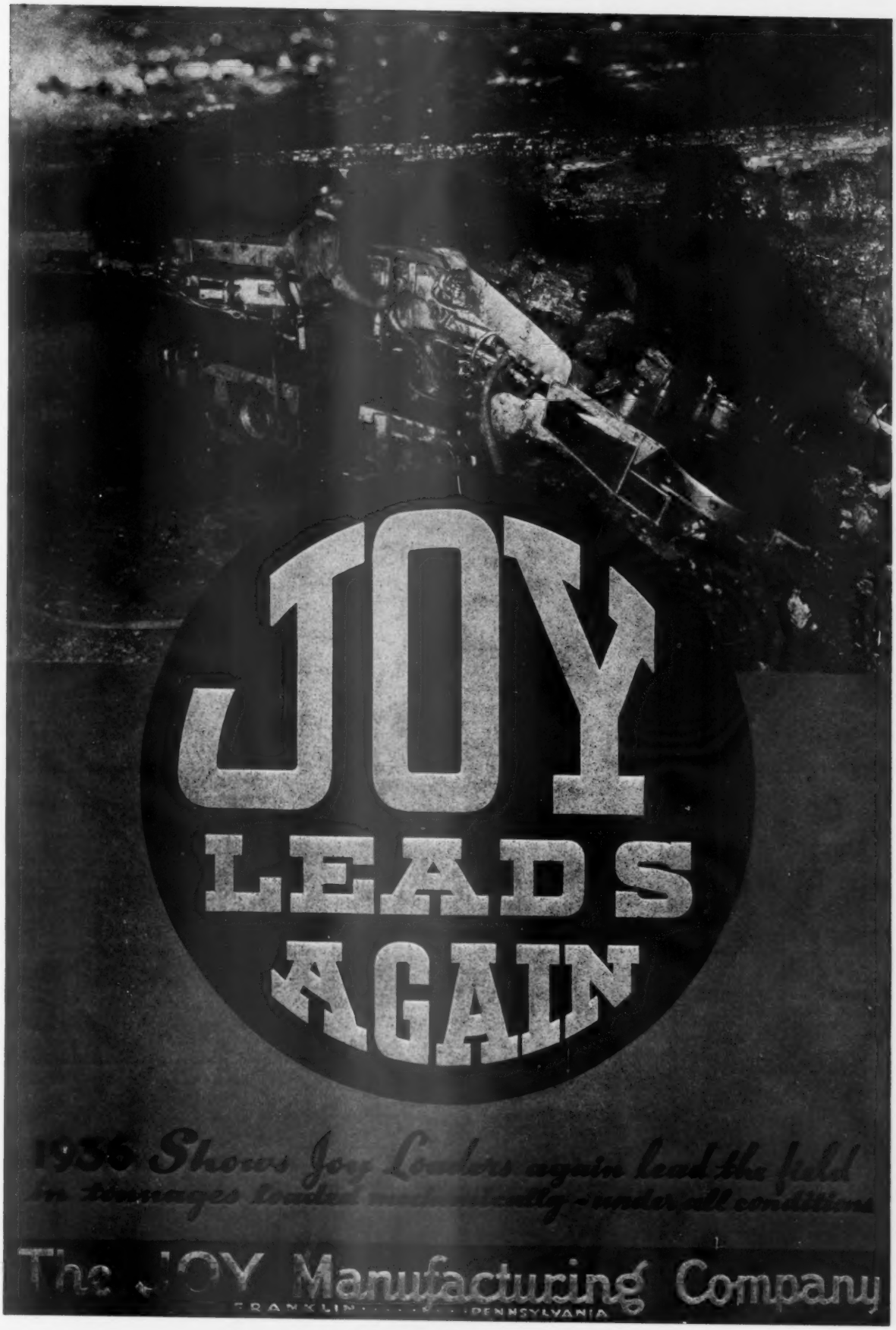
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Vol. 23 FEBRUARY, 1937 Number 2

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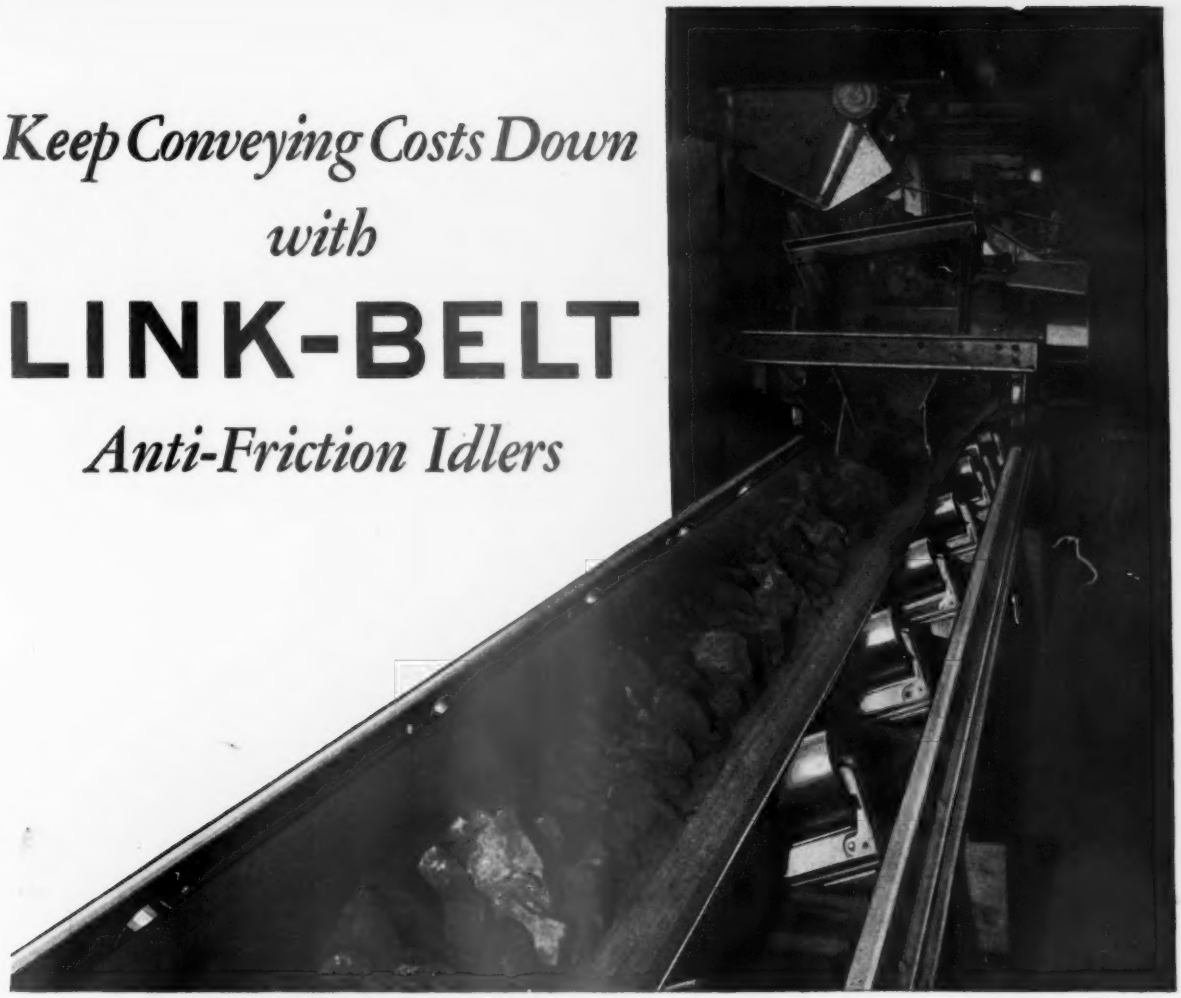

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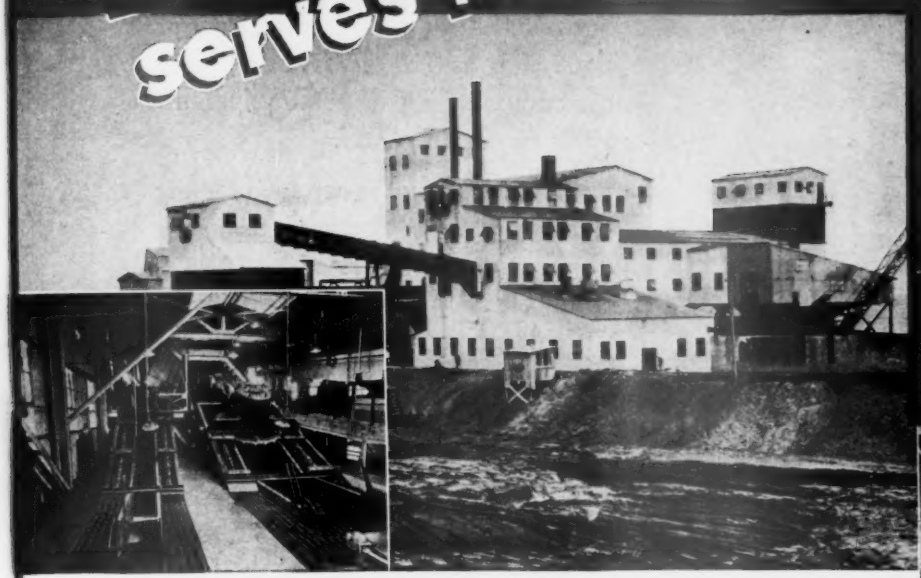

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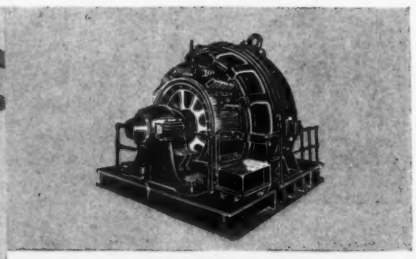

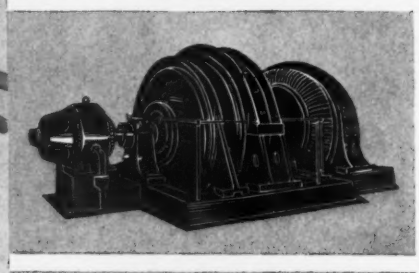

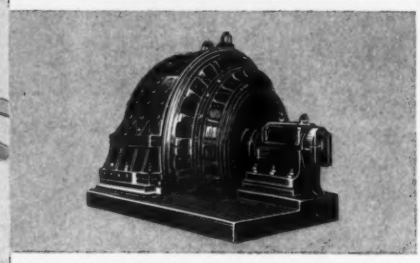

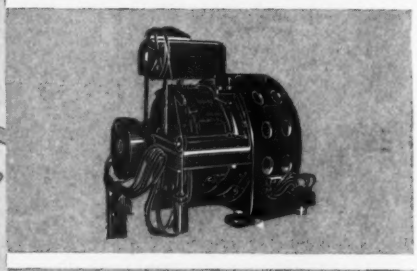

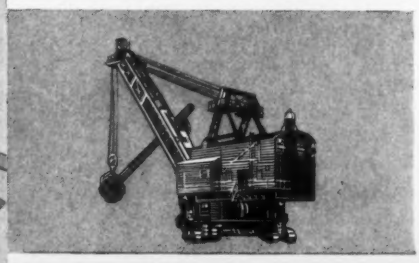

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The Supreme Court

THE functions of the Supreme Court are frequently misinterpreted by those so-called liberals who think they believe in an executive controlled Congress as the spirit of democracy. As an illustration we quote from "The Nine Old Men," a recently published book, as follows:

> "Having completely distorted the 14th Amendment the Court now set up in its stead, its own omniscient wisdom and having already swallowed the Constitution, it became a body of experts, which from 1890 legislated as such, its decisions determined not by law but by what the economic views and prejudices of a majority of the Court happen to be on that particular issue. * * * Thus the Supreme Court, created by the founding fathers as a tribunal of law, has spent its latter days in deciding whether Chinese laundries, etc., etc., and hundreds of other similar measures, are sound economic practice. * * * And as the years have passed, the pace of the Court in declaring federal laws unconstitutional has accelerated. * * * During the 12 years from 1924 to 1936 these nine old men became insatiable and the number of federal acts which went down the maw of unconstitutionality increased to 23 or an average of almost two a year. * * *
>
> "As the appetite of the nine old men became more insatiable, their tastes became more demanding * * * their appetites reached out for laws extending to the vitals of the nation. * * * They had become legislators, not jurists. They had taken into their own hands the right of self-government * * * the descendants of those who once fought Britain for legislative liberty have found that liberty deftly stolen from their hands. * * * And today the Supreme Court has become the protector of the industrial overlords."

The writer does not desire to discuss the slanderous scurrility of these statements, but to correct the impression which may be created as to the functions of that great judicial body, the Supreme Court of the United States.

It would seem from these quoted statements that the Supreme Court develops the cases which come before it, when as a matter of fact, nearly all of the issues which it determines are brought before it on appeal from some lower Federal District or Circuit Court, which inferior court has been created by Congress and may be abolished by Congress.

Its original jurisdiction is limited to cases affecting ambassadors, or other public ministers or consuls or those in which a state shall be a party.

The Supreme Court considers only cases in which an issue has been developed between actual litigants. Its decisions are based upon established legal principles.

It has not seen its way clear to decide the issues before it on the basis of the "economic views and prejudices of a majority" which is precisely what Congress very properly does as representatives of its constituents. Congress may safely so legislate but the Supreme Court of the United States is charged with the responsibility of protecting the Constitution against the changing winds of public opinion and of seeing that the public will of the nation, not of the day or tomorrow but throughout the years shall prevail.

There is danger enough, to our Democratic form of government, through amendments to the Constitution in accordance with its provisions as proven by the 18th Amendment's adoption and repeal.

Surely no easier method should be sought or tolerated. We are happy in the fact that the Supreme Court of the United States has withstood the crusade to force it to decide major issues submitted to its judgment "by the economic views and prejudices of a majority."

Public opinion is too largely swayed by economic conditions to make its conclusions at any particular time a safe guide in governmental affairs.

The Constitution of the United States as construed by the Supreme Court is our Rock of Ages, as firmly fixed in the conscience of America as the Ten Commandments or the sermon on the Mount.

The Mining Congress Journal

Volume 23 FEBRUARY, 1937 Number 2

E. R. COOMBES, Editor

A Journal for the entire mining industry published by The American Mining Congress

Mining and 1937

WHEN WE CONSIDER that two-thirds of the Nation's wealth comes from minerals we begin to appreciate the magnitude of the industry. Millions depend upon it for a livelihood and when, for whatever reason, production is curtailed repercussions are felt throughout all industry.

Since 1936 the recovery forces in this country have shown remarkable strength, and the mining industries have led the way. Thus we find that bituminous coal is rapidly approaching the 1929 peak, the 1936 record being approximately 77 percent of that year's production. This augurs well for business prosperity, for the greatest tonnage is used by the railroads, the manufacturing industries, and the utilities. Estimates from various sources indicate that 1937 production will approach the five hundred million ton mark. Anthracite coal considerably bettered its 1935 production record. This industry is making rapid strides against the competitive fuel situation and is displaying leadership and ingenuity in developing devices to meet the inroads into its markets.

In the precious metal and base metal industries production is mounting rapidly. Both gold and silver production maintained high records in 1936, and the outlook for 1937 is definitely encouraging. Copper, lead, and zinc have shown great activity. These industries, which were so severely involved in the depression, have steadily improved their position, reducing stocks and improving market demand. The outlook for 1937 is the best in many years.

From all other branches of mining there are encouraging reports, and there is every indication that this will be a prosperous year for the mines. However, there are many disturbing factors. Legislation passed and pending may seriously handicap progress; labor difficulties loom large upon the industrial horizon; State Legislatures, searching for revenue, are overhauling their laws, and at many points there are danger signals. Great care should be exercised that in our zeal to reach prosperity we do not defeat our aims.

Government Reorganization

IN PRACTICALLY ALL administrations for the last fifty years there has been much talk about reorganization of government departments. Each President has approached the subject with more or less vigor, and some few, notably Herbert Hoover, accomplished not a little. Each effort to reorganize, consolidate, and "modernize" government structure has met with obstinate opposition, and history would indicate that that opposition has been successful to a degree.

The President's announcement of a re-arranging of the government functions has brought a veritable storm of disapproval. Practically every department is willing to have reorganization, provided there is no change in its set-up.

There is no denying that government procedure may be simplified and much red tape dispensed with by a simplification of the machinery. The proposal of the President, in detail, is too far-reaching, too important to briefly consider as a whole in one editorial. Suffice it to say that the idea is desirable—and not new—but the means must be considered from various angles. The final result should of course look to the best good of the entire structure and not to the immediate antagonisms of various factions that are involved. Many toes must be stepped upon and much ill-feeling is bound to ensue. The President and Congress do not have an enviable job in the effort to arrive at greater efficiency in handling the gigantic governmental machine.

Interest on Our Debt

MUCH LEGISLATION of vital importance has been proposed by the present session of Congress. Perhaps none should receive greater consideration than the matter of a balanced budget and a reduction of our national debt. Figures taken from the 1937 Budget do not carry consolation. Here they are:

Year	Interest on public debt
1932	$599,300,000
1933	689,400,000
1934	756,600,000
1935	820,900,000
1936	749,400,000
1937 (estimated)	835,000,000
1938 (estimated)	860,000,000

It should not be overlooked that the interest on our national debt is greater than the combined cost of maintaining the legislative, judicial and civil functions of government. Interest upon our public debt is almost equal to the cost of maintaining the Army and Navy!

There is but one answer: A reduction in national expenditures. The present Congress can do this and future generations a great service indeed by tightening the national purse strings.

Progress in Mining 1936

Encourage Mine Development

THE MINING INDUSTRY, in all its branches, must be kept active and in a healthy, prosperous condition. Prospecting for new reserves should be encouraged. Exploration and development work must be continuous. Research and investigation should be constantly carried on. Investment in mining enterprises should not be discouraged or diminished by a critical or indifferent attitude on the part of the Government. Policies in the administration of mining laws, in the enactment of legislation affecting the mining industry, and in the taxation of mines, both generally and locally, should be liberal, friendly and cooperative; and in every way should afford all possible protection and safeguards against uneconomic and destructive tendencies that from time to time appear. Mine development should be encouraged because of its vast economic importance in our national life.

THE EDITORS.

Some DEVELOPMENTS in the METAL Mining Industry in the United States, 1936*

By Chas. F. Jackson†

VIEWING the metal-mining industry broadly during the last several years, one is impressed by the resourcefulness displayed in adjusting policies and operating technique to a most difficult situation, and in adopting methods and practices designed to reduce costs to meet low metal prices. As a result of these readjustments the industry emerged in 1936 with a generally lower cost base than before the depression and with substantial profits as prices rose, but were still below the long-term averages.

The year 1936 witnessed a material increase in mining activity, not only in the precious-metals field but also in iron-ore and nonferrous-metal mining. With gold at $35 per ounce and the price of silver relatively stable throughout the year, the incentive to develop ores formerly submarginal in grade and to reopen abandoned mines continued. Better transportation facilities in some outlying districts provided by road construction

* Published by permission of the Director, U. S. Bureau of Mines. (Not subject to copyright.)
† Chief Engineer, Mining Division, U. S. Bureau of Mines.

Sunshine Mining Company Camp at Big Creek, Six Miles East of Kellogg, Idaho.

and improvement materially assisted many small-scale operators to survive, and the aggregate quantity of sorted ore and concentrates shipped by truck must have been large.

Prices of nonferrous metals increased during the year, the advance being accelerated toward its close. These advances were accompanied by increased production and substantial increases in basic wage schedules at the mines.

It appears that in some districts a shortage of skilled mine labor is developing, due to resumption or expansion of operations by the larger companies; reopening and development of small gold and silver mines; absorption of skilled miners by leasing operations; and the fact that few new men were trained during the depression years.

Placer Mining.—Of special interest in the placer-mining field is the improvement in equipment and operating technique at operations employing draglines, scrapers, or power shovels for excavation, with the gold-saving equipment installed either on a floating barge or on a mobile land mounting. During several preceding years, many excavating contractors turned to placer mining as a means for profitable employment of their idle equipment. Few of these were successful at the start, due to failure to appraise correctly the value of the ground, faulty equipment or faulty application of the equipment, and other factors attributable to inexperience. However, this method of placer mining has been gradually perfected, and 1936 witnessed the success of a considerable number of operations. Completion of several new dredges was reported during the year.

Several placer operations financed by the Reconstruction Finance Corporation had a successful year and some emerged free of, or with substantially reduced, indebtedness.

Small Lode Mines.—The number of small-scale operations active in 1936 was large. Visits to small mines operating on meager capital revealed that the ingenuity of the old-time miner persists in the present generation when it comes to improvising equipment. On the other hand, there appears to be an increase in the number of small mines where modern mining and milling plants with equipment suited in type and capacity to the conditions under which it is employed, give evidence of careful engineering design. The trend toward installation of Diesel power units for local generation of power is noticeable.

Mining Methods.—Mining methods and practices are usually evolved by a slow process to fit local conditions, and no innovations in mining methods have been reported during 1936. An interesting combination of stoping methods, which might be termed "square-set shrinkage," and is new to the writer, is being employed in some sections of the Carson Hill mine (Calaveras County, Calif.), where the walls are weak and ordinary shrinkage stoping cannot be used. The method is described by John A. Burgess in a forthcoming Bureau of Mines information circular. Square-set sections are stoped up 20 ft. long and one to four sets wide. The sets are kept full of broken ore until the section is completed; then the ore is quickly drawn, and waste filling is run in to take its place.

Shaft Sinking.—During 1936 a circular shaft 5 ft. in diameter was completed at the Idaho-Maryland mine, Grass Valley, Calif., to a depth of 1,125 ft.; stations were cut at two levels, and guides and cage were installed. This shaft was sunk with a shot drill at low cost in spite of the fact that considerable experimentation with this method of sinking a deep shaft was involved. The operation has been described in the technical press and in Bureau of Mines Information Circular 6923.

Mechanization.—The use in underground mines of mechanical loaders of both the shovel and the scraper type was appreciably increased, particularly in the western districts where such equipment had not already come into as general use as in some of the central and eastern districts. Of particular interest is the increased use of mechanical shoveling in headings of small cross-section, made possible by the development in recent years of machines especially suited to such work. It is now economical to pull as long rounds as possible in small headings, since there is no difficulty in loading out the rock with mechanical loaders in one shift or less.

Detachable Rock Drill Bits.—A large increase in the use of detachable rock-drill bits in metal mines has apparently occurred during the past year. The Metal Mining Research Section of the Mining Division, Bureau of Mines, completed the first stage of a comprehensive investigation of the use of these bits in mines, studied about 35 operations in the field, and published two information circulars in the form of progress reports on this subject. Two more reports will be released shortly. In some mines, where these bits are employed almost exclusively, it is noted that as experience in their use has been gained, better all-around efficiency is being secured with them, and more regrinds per bit are obtained at a lowered cost per regrind. Some users are retempering the reground bits, and at least one has been successful in reforging worn bits. It is reported that success has also been obtained with hard-surfacing.

Ventilation and Air Conditioning.—Improvement of mine ventilation continued to receive the earnest attention of metal-mine operators. As our mines become deeper, improved ventilation becomes not only desirable but necessary. The advantage of controlled mechanical ventilation as compared to natural draft which may be least controllable when control is most needed is becoming better known to metal-mine operators, resulting in an increased use of mechanical ventilating equipment.

Air-conditioning in the form of air-cooling by other means than simple improvement of air circulation is comparatively new in this country, and the Anaconda Copper Mining Company continued its pioneering work thereon at Butte, Mont. When the writer visited Butte at midyear, installation of an enlarged and improved cooling tower was well under way. A number of other companies with cooling problems are seriously studying the application of air-cooling equipment to improve mine conditions.

Increased attention is being given to the removal of dust from mine atmospheres. Determination of the effects of atmospheric dusts upon mine workers is a subject within the province of health specialists, but with the realization that certain dusts are especially harmful under certain conditions, and with the enactment of laws by some of the states

for the control of dust conditions in industry, the matter of eliminating or reducing atmospheric dust is one of vital interest to the operator and engineer upon whom falls the task of dust control in actual operations. Sincere efforts are being made by many mine operators to investigate, test, and adopt methods of control that give promise of results.

Mining Research.—Mining has not generally been considered a subject susceptible to research in the same sense as other engineering arts, such as metallurgy and ore dressing. Recently, however, attention has been drawn to the possibilities of mining research along certain lines. The research conducted by the Colorado School of Mines has been described in articles published during 1936. The laboratory work of Professor Buckey, at Columbia University, on failure of rock structures based on the principle of similitude has been going on for several years and affords another example of attention to mining research. At least one large mining company has a mining research department, and other investigators might be mentioned.

During 1936 the Bureau of Mines started field studies designed to determine the amplitude, frequency, and rate of propagation of earth and rock vibrations caused by blasting in quarries. Experiments designed to develop means of determining relative stresses in rock arches and pillars in mines were begun on a small scale. A testing adit was started, in which the Bureau proposes to conduct investigations under controllable mine conditions along several lines, including rock drilling; dust prevention and control in drilling, shoveling, and blasting operations; blasting, with particular reference to production of noxious gases; and ventilation.

Advancements in COAL RESEARCH And TECHNOLOGY in 1936*

By Arno C. Fieldner†

THE steady progress of coal research in the United States during 1936 is one of the gratifying features of the uplift from the depths of the depression. Fundamental and applied research in coal technology is now being conducted at a number of centers. Bituminous Coal Research, Inc., reports that some 40 laboratories as engaged to some degree in research on coal and coal utilization.[1] At least 10 of these laboratories may be considered major contributors to our knowledge of coal and advances in coal technology. This is a good start but much remains to be done, as indicated by the report of the Committee on Bituminous Research Planning recently published by the Coal Division of the American Institute of Mining and Metallurgical Engineers.[2]

Celebration of the sixth anniversary of the Coal Research Laboratory of the Carnegie Institute of Technology on December 3, 1936, marked an important milestone in the growth of fundamental scientific research on the nature of coal. The continued financial support of this laboratory by industry, as well as projects at other institutions, augurs well for the future advancement of coal preparation and utilization.

Composition, Classification, and Testing

Forty-three publications were issued by the Coal Research Laboratory during the six years of its existence. These give the results of the various methods of attack on the problem of the chemical nature of coal. Treatment of coal with various solvents; oxidation and halogenation with chemical reagents; reduction with hydrogen; and distillation *in vacuo* at low temperatures all point to the hypothesis that bituminous coal is composed of polymers of high molecular weight built up largely from condensed six-membered ring structures.

The American Standards Association has approved a tentative American standard for the classification of coal according to rank and grade[3] thus providing authoritative boundary lines between anthracite, semi-anthracite, low-, medium-, and high-volatile bituminous coals, sub-bituminous coal, and lignite.

The American Society for Testing Materials has adopted as tentative the Hardgrove and Ball Mill methods for determining the grindability of coals.[4]

The Bureau of Mines has published the results of a critical study of methods for determining the plasticity and the plastic range of coals on heating.[5] This work will be valuable in connection with the design and operation of stokers for coals of different caking properties and in the selection of coals and blends of coals in the manufacture of coke.

Preparation of Coal

Scientific control of coal washing by operators has made considerable progress. Research on the addition of flocculating agents, such as starches and protein compounds, has shown that they have definite value and are not too expensive for the clarification of circulating waters at coal washeries.

The treatment of coal with oil to render it dustless has been greatly improved through research by the oil companies and coal companies, and the practice of oil treating is growing rapidly.[6] The practice of briquetting slack coal and wrapping the briquettes in paper also has grown in the last year, especially with the friable low-volatile coals.

Combustion Research and Technology

Knowledge of the nature and magnitude of the actions that occur during the process of burning of a piece of carbon was further increased by a progress report of the systematic work of the Massachusetts Institute of Technology; the over-all result of combustion in fuel beds is the summation of such individual actions. The Fuel Research Laboratory of the Carnegie Institute of Technology[7] has shown that the actions through a fuel bed—and the final result—can be defined by mathematical expressions and, although the development to date only covers an elementary bed, treatments of this type will be helpful in generalizing the effects of any one property of the fuel or of the conditions.

Greater recognition is given each year to the possibilities in better preparation of coals to fit the furnace or conditions of use. The great importance of size is better understood and has been brought to the fore by the increasing demands for coal for household stokers; this is a major research of the Battelle Institute for Bituminous Research, Inc.[8] Coal producers maintain their interest in the possibilities of treatment of coal with small quantities of chemicals; the Bureau of Mines has completed an extended investigation of the effects of chemicals on fuel beds, and the report will be issued soon. The Bureau[9] has completed its studies of underfeed combustion and is now taking up the fundamentals of the overfeed process.

The Anthracite Institute Laboratory is continuing its work on the development of a new principle of furnace design for the burning of anthracite in small heating boilers. In this design the usual "combustion space" has disappeared, the combustion being complete within the bed of glowing coals.[10] Further application of water-cooled surfaces in the fuel bed to prevent clinkers is being studied.[11]

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† Chief, Technologic Branch, U. S. Bureau of Mines, Washington, D. C.

[1] Resume of Current Research in Coal and Coal Utilization. Compiled by Bituminous Coal Research, Inc., Southern Building, Washington, D. C., 37 pp., 1936.

[2] Bituminous Coal Research, Coal Division, A. I. M. M. E., 85 pp., 21 graphs, 1936.

[3] Fieldner, A. C., "American Standard Sets Up Common Language for Coal," Industrial Standardization and Commercial Standards Monthly, Vol. 7, pp. 273-8.

[4] Determination of Grindability of Coal—Tentative Standards, 1936, American Society for Testing Materials (in press).

[5] Brewer, R. E., and Atkinson, R. G., "Plasticity of Coals—Its Measurement and Relation to Quality of Coke Produced," Ind. Eng. Chem., Anal. Ed., Vol. 8, 1936, pp. 443-9.

[6] Schmidt, L. D., "Dust Prevention Treatment of Solid Fuels," U. S. Bureau of Mines Information Circular 6932.

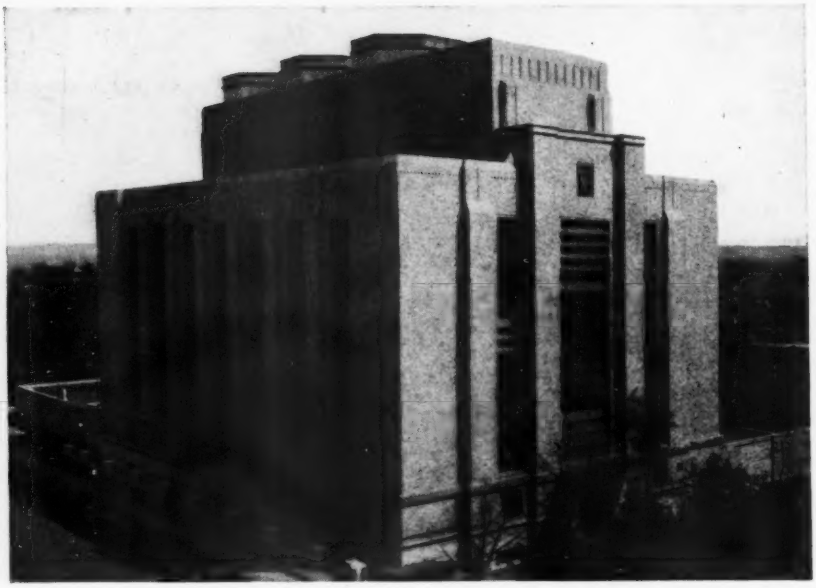
[7] Mayers, M. A., "Some Factors Affecting Combustion in Fuel Beds," A. I. M. E., Coal Division, 1936.

[8] Sherman, Ralph A., and Kaiser, E. R., "The Relation of the Size of Bituminous Coals to Their Performance on Small Underfeed Stokers. Part I—The Relation of the Size in the Hopper to That Burned in the Retort," Technical Report No. 1, Bituminous Coal Research, Inc., 1935.
Sherman, R. A., and Kaiser, E. R., "Combustion of Bituminous Coal on the Small Underfeed Stoker," A. I. M. E., Coal Division, Technical Paper 750, 1936.

[9] Nicholls, P., "Underfeed Combustion, Effect of Preheat, and Distribution of Ash in Fuel Beds," U. S. Bureau of Mines Bulletin 378, 1934, 76 pp.

[10] Johnson, A. J., "A New Principle of Furnace Design for Anthracite," Anthracite Institute Laboratory, Report No. L 2312.

[11] Johnson, A. J., "Furnace Design with Relation to the Prevention of Clinkers," A. I. M. E., Coal Division, October, 1936.



Central Heating Plant, Washington, D. C.

A new field of possibilities is indicated by work in England which shows that there tends to be a definite relationship between the proportion of various sizes of coal from a given mine, independent of the actual top size or whether the coal is from mine or breaker. As far as this is found to be true, it will permit of better planning to suit market requirements.

Each year the mining and power companies take over an increasing part of research. This year emphasis has been on improvement of the operation of large underfeed stokers by controlled distribution of the air, and by water cooling of the stoker parts to facilitate the use of coals with low-fusion ash. In pulverized-coal furnaces the tendency is toward reduction of the furnace volume and higher rates of heat transfer, with continuous tapping for slag-tap furnaces.

The erection of the central heating plant at Washington, D. C., was a bold movement to eliminate a great many small heating plants, both oil- and coal-fired, operating at various efficiencies.[12] About 115,000 tons per year of ¾-in. slack medium volatile coal are now being burned in the plant, with a maximum hourly load of 735,000 lb. of steam. The average over-all efficiency is about 80 percent. This plant is placed among the fine Government buildings in Washington. It has an exterior architectural appearance in keeping with the other buildings. The equipment was designed to handle the most economical coal available to the District and was so designed that smoke and flyash, which might mar the surrounding buildings, have been eliminated. The burning equipment, of underfeed stoker design, has been carried through with the latest improvements, using water wall furnaces, ample size stokers, and clinker grinders. The furnace volume is designed to permit proper combustion at all times under automatic control, and other safeguards are provided, including cinder catchers and Cottrell precipitators. This plant supplies steam at 200 lb. gauge pressure to about 70 buildings, some of which are about a mile and a half from the plant. These include such important Federal buildings as the White House, all of the new buildings in the Triangle, Bureau of Engraving and Printing, Agriculture, and Army and Navy Buildings. In addition, it supplies steam to the Red Cross unit and the Pan-American Building.

Carbonization

The Coal Laboratory of the Carnegie Institute of Technology[13] has found that the rate of heating through the preplastic range affects the yield and quality of the carbonization products to a considerable extent. Apparently depolymerization and also polymerization take place over this range of temperature, and the action is more pronounced at favorable rates of heating.

Whatever the explanation may be, it is known that bituminous coal is very sensitive to treatment at temperatures below that at which carbonization is commonly believed to set in. The Bureau of Mines has shown that even very mild oxidation (at 30° C.) of coal has a decided effect on the yields and quality of carbonization products obtained.[14] Oxidation improved the quality of coke from a Pittsburgh bed coal.

The U. S. Bureau of Mines is continuing the survey of gas-, coke-, and by-product-making properties of American coals, and has issued three publications.[15]

Hydrogenation of Coal

The Mineral Industries Experiment Station at Pennsylvania State College, in cooperation with Bituminous Coal Research, Inc., is continuing experiments on the hydrogenation of coal for the production of fuel oil, and is studying the fundamentals of the hydrogenation process.[16]

The Bureau of Mines at the Pittsburgh Experiment Station has completed a small pilot-scale plant designed for the continuous hydrogenation of 100 lb. of coal per 24 hours. Studies of the hydrogenating characteristics of different kinds of American coals will be made in order that some first-hand knowledge may be available for proper appraisal of the important developments abroad in the production of motor fuel from coal.

ANTHRACITE in 1936

By E. W. Parker*

OUTSTANDING in the annals of the Anthracite Industry in 1936 were (1) the negotiation of a new wage agreement to succeed the one terminated on April 1, and (2) the organization and launching of "Anthracite Industries, Inc." after several years of discussion of this type of sales promotion. Of scarcely less interest were advantages secured in some of the more important markets by freight rate reductions, "motor compelled," the development of a cooperative merchandising policy among retail dealers in New York City, and increased perplexities arising from the stolen coal problem and the struggle to solve it.

The Wage Negotiations

The negotiations for a new wage agreement began on February 24 and were not concluded until May 7, practically 11 weeks of discussion and argument. The meetings of the joint committee of operators and miners were, by courtesy of the American Institute of Mining and Metallurgical Engineers, held in the board room of the Institute

* Secretary, Anthracite Institute.

[1] Barkley, J. F., and Peter, Charles A., Jr., "Equipment and Operating Data on the Federal Central Heating Plant," Combustion, Nov., 1936, pp. 27-32.

[13] Warren, W. B., "The Effects of the Rate of Heating and of Final Maximum Temperature in the Carbonization of a Series of Coals of Increasing Rank," presented at the Fall meeting of the American Chemical Society, Pittsburgh, 1936.

[14] Schmidt, L. D., Elder, J. L., and Davis, J. D., "Oxidization of Coal at Storage Temperatures—Effect on Carbonizing Properties," Ind. Eng. Chem., Nov., 1936, Vol. 28, pp. 1346-53.

[15] Fieldner, A. C., Davis, J. D., Thiessen, R., Selvig, W. A., Reynolds, D. A., Jung, F. W., and Sprunk, G. C., "Carbonizing Properties and Petrographic Composition of Clintwood Bed Coal from Buchanan Mines Nos. 1 and 2, Buchanan County, Virginia," U. S. Bureau of Mines, Technical Paper 570, 1936, 34 pp.

———, "Carbonizing Properties and Petrographic Composition of Pittsburgh Bed Coal from Pittsburgh Terminal No. 9 Mine, Washington County, Pa.," U. S. Bureau of Mines, Technical Paper 571, 1936, 33 pp.

Fieldner, A. C., and Davis, J. D., "The Bureau of Mines—American Gas Association Carbonization Test and Its Use in Determining the Effect of Blending Coals on the Yields and Properties of Coke, Gas, and By-Products," Transactions of Chemical Engineering Congress of the World Power Conference in London, June, 1936. (In press.)

[16] Wright, C. C., and Gauger, A. W., "Progress Report on Coal Hydrogenation," Technical Report No. 2, Bituminous Coal Research, Inc., 1936, 25 pp.

at 29 West 39th Street, New York City, the joint committee consisting of:

For the Anthracite Operators:

Wm. W. Inglis, president, Glen Alden Coal Co.; R. E. Taggart, president, P. & R. C. & I. Co.; J. B. Warriner, president, Lehigh Navigation Coal Co.; James H. Pierce, president, East Bear Ridge Colliery Co.; A. B. Jessup, president, Jeddo-Highland Coal Co.; Michael Gallagher, president, the Pittston Co.; James Prendergast, president, Susquehanna Collieries Co.

For the United Mine Workers:

Michael J. Kosik, president, District No. 1; Hugh V. Brown, president, District No. 7; Mart F. Brennan, president, District No. 9; John L. Lewis, president, United Mine Workers of America; Philip Murray, vice president, United Mine Workers of America; Thomas Kennedy, secretary-treasurer, United Mine Workers of America.

The agreement, finally arrived at, continued the existing contract until April 30, 1937, after which date the working day of all employes was reduced from 8 to 7 hours and the work-week from 6 to 5 days, a reduction in the standard work-week from 48 to 35 hours, with provision, however, for a total of 12 weeks of 6 days each, the new work-week to extend for one year or until April 30, 1938. How this change will affect costs, prices and markets for anthracite remains to be seen.

Anthracite Industries, Inc.

Anthracite Industries, Inc., was organized in June, with Frank W. Earnest, Jr., formerly with the Spencer Heater Company of Williamsport, as president, and G. Gordon Cook as secretary-treasurer, and with offices in the Chrysler Building, New York City.

Anthracite Industries, Inc., has for its purpose coordinating the efforts of all interested in the consumption of anthracite looking toward a wider acceptance of this particular fuel. Obviously, the first job was to set up an organization and to formulate plans that would stand the test of time which had necessarily retarded the development of a workable program.

The basic concept behind the Anthracite Industries, Inc., is that the ultimate consumer is primarily concerned with satisfactory heating achieved with convenience; that individual consumers differ in their concepts of convenience; and that anthracite properly burned in proper equipment gives the greatest satisfaction obtainable in home heating.

To further this concept, field men have been appointed covering the entire anthracite burning area charged with the responsibility of coordinating the efforts of retailers, heating contractors, equipment manufacturers and distributors toward assuring complete heating satisfaction and toward informing the public what is obtainable with anthracite. In addition, a carefully worked out advertising campaign as a background against which individual producers can get greater results for their retail outlets from their own advertising programs is in process.

Included in the activities of Anthracite Industries is a number of shows in strategic cities to familiarize the consumer with modern anthracite equipment—shows similar to the one staged at the Eastern States Exposition last September.

In this program of coordinating the efforts of all interested in "The Solid Fuel for Solid Comfort," Anthracite Industries fully recognizes the importance of retailer cooperation and in return for that pledges its best efforts on behalf of the retail merchant.

The territories that have been designated with representatives up to the time this article is written are as follows:

Brooklyn and Long Island, New York City, Albany, N. Y., Syracuse, N. Y., Rochester, N. Y., Philadelphia, Pa., Allentown, Pa., Northern New Jersey, Southern New Jersey, Boston, Mass., Springfield, Mass., Toronto, Canada, Montreal, Canada.

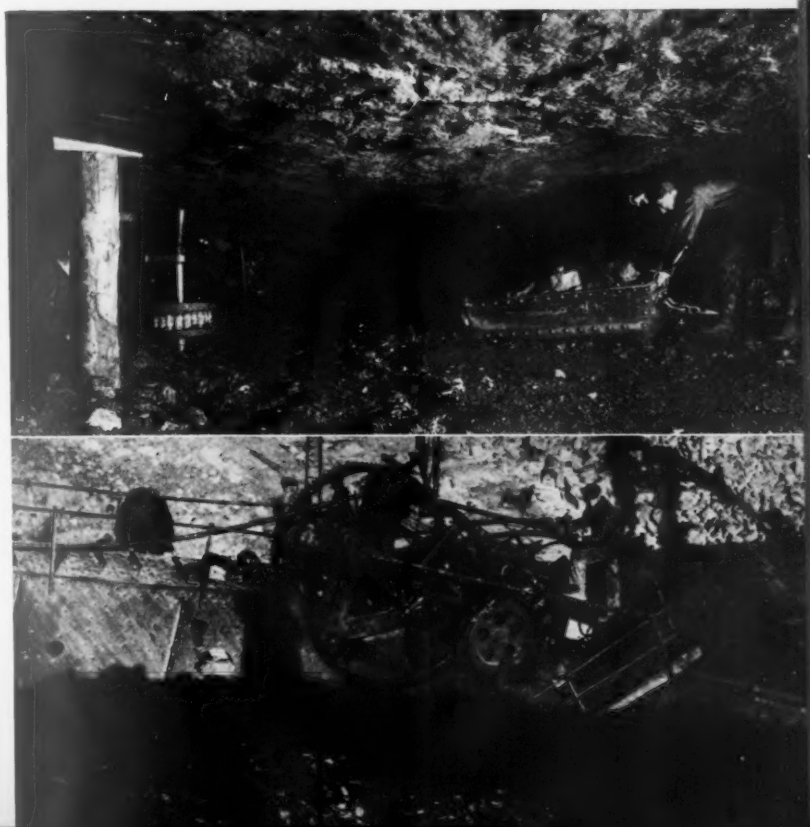
The Retail Trade Coordinates

One of the encouraging incidents of the year was the development of a seemingly real get-together feeling on the part of the retail coal trade, exemplified particularly in the New York Metropolitan District by the designation early in June of Roderick Stephens as Coordinator of the Retail Solid Fuel Industry. As Mr. Stephens himself said, his task, as he understood it, was to endeavor to minimize unfair and destructive practices in the industry. Knowing Mr. Stephens, as most of the retail dealers do, much good to the trade is hoped for as the result of his assuming the office of Coordinator, and it is also hoped that the spirit will spread. Mr. Stephens has established headquarters in the Chrysler Building, Forty-second Street and Lexington Avenue, New York City, where he is conveniently located for cooperation with Anthracite Industries, Inc. Mr. Stephens is acquainted with the retail branch of the Solid Fuel Industry throughout the whole United States. His experience as a member of the National Retail Coal Merchants Association, Original Code Committee, and later on as chairman of the Retail Solid Fuel National Code Authority brought to him an experience and acquaintance that are of great value in his present position. There is no question but that he is the outstanding man of the Retail Solid Fuel Industry of the country.

The Freight Rate Reductions

As to "motor compelled" freight rates: During the preceding year at the urgent behest of anthracite operators and dealers, and in order to enable the industry to compete with the increased volume of truck-borne anthracite, both legitimate and stolen, the carriers published what they termed "motor compelled" freight rates, these being in effect reductions on the prepared sizes to all points in New Jersey and Delaware, the District of Columbia, eastern Pennsylvania, eastern Maryland, and to a number of points in southern and central New York state. They did not apply to tidewater deliveries at New York and Philadelphia. These reduced rates, originally of a temporary nature, have been extended from time to time both in area covered and by expiration dates. They are now scheduled to expire on March 31, 1937.

Top—Scraper at Face. Below—Underground Hoist.



Stolen Coal

As the Governor of Pennsylvania has definitely signified his intention not to exercise his authority to terminate the stolen coal traffic in the anthracite region, the law officers of other states are beginning to take notice. Perhaps the outstanding development has been the indictments handed up by the grand jury of New York County against two operators of sales outlets for stolen coal, and the subsequent presentment handed up to Governor Lehman in September by the August grand jury, as the result of its investigation. During September and October additional arrests were made in New York County, and in the latter part of October Assistant District Attorney McDermott held a meeting of the district attorneys of the affected counties in New York state, the state police, and the licensing and weight inspection agencies of the state, in an endeavor to bring the traffic under control.

A number of trucks were found transporting anthracite, both legitimate and stolen, through New England cities. The Anthracite Institute joined with the carriers in protesting a number of applications for certificates of public convenience and necessity, of both contract and common carriers by motor vehicle in the transportation of coal. One of these involved a trucker residing in Vermont, who desired to haul granite to a point near the producing region and bring coal back.

Reciprocity

Mention might be made of the action of the Mayor of Philadelphia, S. Davis Wilson, who, following a visit to the anthracite region, expressed a determination that anthracite shall be the fuel used in all municipal departments in that city. "The people in the anthracite region," said Mr. Wilson, "are good customers of Philadelphia dealers," and he believes in reciprocity. Good gospel also for Boston and other New England cities.

Anthracite Institute Laboratory

(*Transfererd to Anthracite Industries, Inc., on December* 1.)

Definite strides were made by the Anthracite Institute Laboratory during the past year. Recognition of the value of the seal of approval as a safeguard against inferior and poorly designed equipment has reached a point that practically necessitates the use of the seal in all cases where any ambitious sales programs are attempted. Upon being approached by equipment manufacturers an increasing number of retailers ask as their first question whether the equipment has been approved by the Laboratory; consumers are also becoming acquainted with the value of the seal. As a direct result, equipment manufacturers have assumed a more cooperative attitude and virtually all reputable companies are making definite strides in cooperation with the Laboratory toward improvement and betterment of their equipment.

Catalogs and sheets describing approved devices have been distributed to retailers and others by the thousands and as this literature contains an unbiased opinion and description of all approved devices, it is undoubtedly a valuable contribution to the equipment minded retailer.

Other Laboratory activities are proceeding at a very satisfactory pace, with particular emphasis upon the problem of making manufacturers fully conscious of the merit and advantages of anthracite, as well as of furnishing to retailers adequate data and information on both fuels and equipment.

Anthracite Imported Into Boston, Mass.
1936—Net Tons

	Belgium	Scotland	Wales	Russia	England
January	4,665	8,086	6,995	44,571	....
February	2,240	3,959	5,038	16,520	....
March	....	3,547	4,517	26,219	3,370
April	....	....	....	20,747	....
May	....	....	....	28,448	....
June	....	2,975	6,195	15,609	....
July	....	2,827	....	34,157	....
August	....	2,962	7,116	16,831	....
September	....	7,593	....	27,725	....
October	5,228	3,695	....	22,138	....
	12,133	35,644	29,861	252,965	3,370

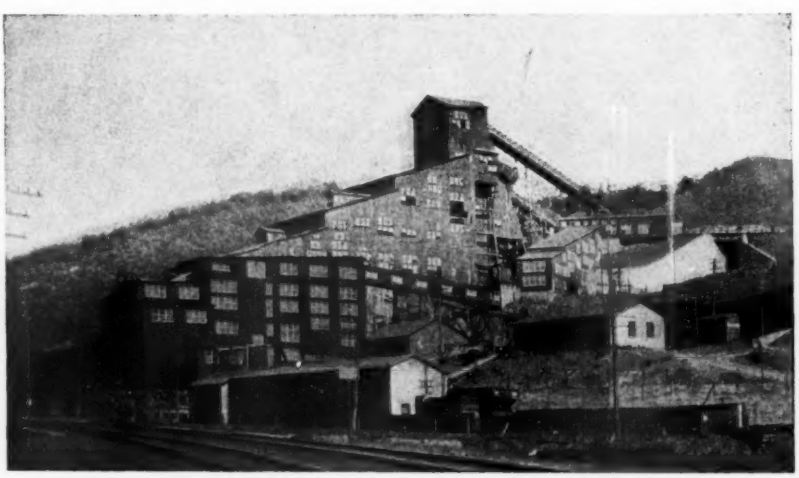
Anthracite Shipments

At the time of writing this review, statistics of shipments were available only up to and including November. In the following table the shipments for the 12 months from December, 1935, to November, 1936, inclusive, and from December, 1934, to November, 1935, inclusive, were as follows:

	Net Tons	December, 1935 to and inc. November, 1936	December, 1934 to and inc. November, 1935
1935	December	4,115,640	4,213,647—1934
1936	January	4,865,207	5,070,658—1935
	February	5,933,723	3,945,542
	March	2,429,194	2,55o,260
	April	4,216,672	4,168,364
	May	4,274,185	4,346,863
	June	3,515,878	4,878,738
	July	3,345,309	3,031,987
	August	2,917,377	2,393,145
	September	3,439,663	3,587,381
	October	3,942,486	3,681,252
	November	3,783,385	2,868,490
		46,778,719	44,741,327

Competition From Foreign Anthracites

Of material interest in connection with the New England market is the consistent increase in the volume of importations of foreign anthracites, particularly of Russian origin. The extent of this traffic has been the subject of numerous articles in the weekly bulletin of the Institute. The extent to which this foreign anthracite has been coming into New England territory is illustrated in the table above.



Caterpillar Diesel RD-6 at the United Electric Co., Near Duquoin, Ill.

BITUMINOUS COAL Has Good Year

By J. D. Battle*

MEASURED in terms of tonnage, 1936 was the best year the bituminous coal industry has had since 1930. Production was roundly 432,000,000 tons, up nearly 125,000,000 tons from the 1932 low, but still 100,000,000 tons short of the 1929 peak. Increased industrial activity in 1937 holds promise of a continuing rising curve in production in our own industry, provided no adverse factors intervene.

Measured in terms of dollars, the 1936 production represented a gross realization at the mines of approximately $750,000,000. Mine wages absorbed approximately $550,000,000 of this total, leaving roundly $200,000,000 to cover the cost of supplies, taxes, insurance, cost of sales, expenses of management, allowances for depletion and depreciation, royalties, and profits, if any.

Approximately 300,000,000 tons of the 1936 production moved on the railroads as revenue freight, and the freight bill of approximately $675,000,000 was a figure larger than the aggregate mine price of the tonnage hauled.

The production and marketing of bituminous coal continues to be beset by high labor costs and high transportation costs on the one hand, and depressed prices and unequal competition of oil and natural gas on the other. Competitive conditions both within the industry and with other fuels in the open market have operated to maintain coal prices below the level of profitable operation for the industry as a whole.

Our industry for the most part is operating under a contract with the United Mine Workers of America, which provides a 5-day, 35-hour week, at the highest wage level in many years, and at a higher per-day and per-hour scale than in any other major industry. This contract expires March 31. The question of a new contract and terms thereof is one of the major factors in the 1937 picture.

Transportation charges on coal is another open question at the moment. The railroad "surcharge," which on application of the carriers was authorized by the Interstate Commerce Commission in April, 1935, and which in the case of bituminous coal averaged 12 cents per ton and amounted on an annual basis to $30,000,000 in extra freight costs, expired December 31, 1936. Hearings before the I. C. C. are now in progress on a petition of the railroads for a permanent upward revision in rates, unitedly opposed by our industry and by consumer interests. Our demands for a downward revision in rates is a step toward checking the present loss of coal markets to competing fuels from which the railroads derive small revenue, and labor derives small employment.

A third major factor of uncertainty in the 1937 outlook for our industry is what legislation will be enacted by Congress for "stabilization" of the industry through the medium of Federal regulation which was undertaken by the Bituminous Coal Conservation Act of 1935, which was outlawed by the Supreme Court in 1936.

* Executive Secretary, National Coal Association.

SAFETY in the Mining Industry in 1936*

By D. Harrington†

THE year 1936, with its numerous upward trends in production and employment as well as other phases of oncoming or actual prosperity, unfortunately had one trend which is by no means satisfactory, in that accident occurrence and accident rates in general also showed an upward trend. Fortunately the mining industry, or at least a major part of it, did not follow this particular phase of the upward trend, and there is good reason to believe that some parts (possibly all) of the mining industry will show a downward turn in accident occurrence as to fatality rates; this probably will also hold true for nonfatal accidents as well.

The coal-mining industry now affords a most encouraging example to other industries, indicating that our coal mining people are definitely on the right track in the matter of removing the stigma of having the worst accident rate of the major industrial occupations. The number of annual fatalities in the coal mines of the United States exceeded 2,000 year after year until 1921 and 1922 when they were 1,995 and 1,984, respectively (or just under the 2,000 mark), thereafter again exceeding (usually by a wider margin) the figure of 2,000 annually until 1931 when they fell to 1,463 from the 2,063 deaths in 1930.

In 1933 coal-mine fatalities in the United States dropped to 1,064 and while much of this was due to a heavy tonnage (hence exposure) decrease, by no means all of the improvement in occurrence of accidents was due to decrease in tonnage because the fatality rate per million tons fell from 3.84 in 1930 to 3.31 in 1931, 3.36 in 1932, and 2.78 in 1933. Moreover, both the number killed and the fatality rate every year since 1933 have continued to remain relatively low (as compared to similar figures for previous years). It now appears that the number killed in the coal mines of the United States in 1936 will total about 1,275, or essentially the same as in 1935, when the total was 1,238; there were 1,222 fatalities in 1934 and 1,064 in 1933, the lowest in any year in the present century.

The year 1933 may be looked upon as

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† Chief, Health and Safety Branch, U. S. Bureau of Mines, Washington, D. C.

establishing a new era in safety accomplishment in coal mining in the United States; in fact, 1932, 1933, 1934, and 1935 (and probably 1936 as well) all maintained much lower fatality rates as well as smaller number of fatalities in coal mining than did any year previous to 1931.

While final figures for 1936 will not be available for several months, the tentative fatality rate per million tons of coal produced for the 11 months of 1936 to December 1 was but 2.27, which is lower than the final rate of 2.39 for the similar period in 1933. As has been stated, that year had the lowest rate in the history of coal mining in the United States. Mr. W. W. Adams, statistical expert of the Bureau of Mines, estimates that the coal-mine fatality rate per million tons produced in the United States in 1936 will be about 2.65. Hence there is reason to believe that 1936 may at least approximately equal even if it should not improve upon the record low fatality rate of 2.78 established in 1933. This would be a real accomplishment, as the tendency in general industry during 1936 was thought to be definitely toward increasing rather than decreasing rate of occurrence of accidents.

In 1936 there were five major coal mine disasters (a major disaster being one with five or more fatalities) in the United States, with total of 37 fatalities; this is not as good as the record of 1935, with four disasters and 35 deaths, or of 1934, with two disasters and 22 fatalities, and is by no means as satisfactory as that of 1933, when there was but one major coal-mine disaster, which caused seven fatalities. However, the past four years, 1933-36 inclusive, with 12 major coal-mine disasters totaling 101 deaths, or an average of three disasters and 25 deaths per year, is a far better showing than that of the first four years the Bureau of Mines was in existence (1911-14 inclusive) when there were 47 major coal-mine disasters with total of 1,447 fatalities or an average of 12 major disasters and 362 fatalities per year, annual coal tonnages being essentially similar. When compared with the average annual record of the period 1911-14, or 12 major disasters per year causing 362 deaths, the five disasters and 37 deaths from major coal-mine disasters in 1936 appear to good advantage even though it is not as good a showing as the record of 1933.

Metal mining probably did not have as fine a record of accident occurrences in 1936 as that established by coal mining, but definite or even tentative figures are not now available. One of the main difficulties now hampering prevention of accidents in metal mines is the operation of many very small mines or prospects with financial inability as well as other inhibitions to take adequate precautions looking to the prevention of accidents. Another influence detrimental to safety in metal mining is the fact that with the resumption of higher prices and more extended markets, many mines that were closed during the depression, or were abandoned due to low-grade ore or lack of readily available ore, are now being reopened, in some instances at least, with limited capital, and this reopening is accompanied in many (probably most) cases by a considerable amount of accident occurrence.

Although metal mining in the United States had been fortunate for several years in avoiding major disasters, the year 1936 was marred by 2 of them, one in Nevada where six men were killed in connection with asphyxiating gas in an underground shaft or winze and another in Idaho where 10 men were killed when a rope handling a man cage broke. The mine-gas disaster was one that could have been avoided by use of reasonably good judgment. The cage accident can hardly be classed other than as unavoidable, inasmuch as the rope broke about 1,200 feet above the cage and a still greater distance from the hoist and with a load far under that which had been handled not only right along but also shortly before the accident occurred; moreover, the rope had been in use much less than a year, and visual inspection showed no evidence of weakness. This rope accident calls attention to the fact that relatively few major accidents are suffered through the breakage of haulage or hoisting ropes, and this is the more remarkable because at present there is no really efficient, dependable method of determining when a hoisting rope becomes unsafe for the use to which it is subjected.

Testing Roof for Safety.

Tunneling for various purposes was more than usually active in 1936, and present-day up-to-date tunnel practice is safety conscious to an extent much greater than a relatively few years ago. One of the outstanding tunneling projects of all time is that now nearing completion in connection with the Metropolitan Water Project of Southern California, for which a total of 102 miles of relatively large bore tunnels have been completed in the last four years. Safety and health features have been given utmost consideration throughout the entire period of prosecuting the work on these tunnels, and decidedly good safety records have been made. These as well as other tunneling operations carried on during 1936, and a few years previous, have demonstrated that tunnel construction can be prosecuted successfully and yet with due regard to the health and safety of the workers.

Nineteen thirty-six saw numerous innovations in connection with health and safety in mining; probably the attention given and changes made in connection with dust occurrence were outstanding. All types of mining and tunneling operations are now realizing the potential harmfulness of dust, and it is being recognized that occurrence of dust in and around mines has numerous disadvantages, even if one should disregard the undue emphasis now placed on health due to respiratory troubles from breathing dust (or possibly certain kinds of dust). Dust respirators are being used to an unprecedented extent in nearly all kinds of mines, coal as well as noncoal; wetting methods of various kinds are being introduced, or used or studied, sometimes with a view to prevent explosions, in some cases to reduce the health hazard, in others to reduce air dustiness as a means of giving greater visibility, hence of enhancing not only safety but also efficiency. More effective ventilation is being obtained by various means in all types of mines, and in many cases the objective is the desirability of reducing air dustiness.

Numerous investigations concerned with mine dust are being made or have been made, and one of the most interesting is as to the effect on vision or visibility due to having large quantities of dust floating in the air of mine working places; in some instances it has been found that the already small amount of light given the underground worker has its efficiency decreased from 75 to as much as 90 percent when large quantities of dust are thrown into the air during certain dusty processes.

Attention to health and safety in the operation of all industrial work is very much to the fore; those who are farsighted in the mining industry are not lagging, and the mining industry is in a commanding position to lead in this

movement rather than to follow. There is absolutely no question now that well-directed attention paid to health and safety in mining returns heavy dividends not only in benefits of various kinds to the workers but also in dollars-and-cents to the owners and operators.

Factors Affecting International Trade in MINERAL RAW MATERIALS*

By J. S. McGrath†

THERE are reliable indications that world production of practically all industrial mineral raw materials increased in 1936 as compared with immediately preceding years, and while the tonnage of such materials entering international trade likewise increased, national policies intended to stimulate domestic production in several major industrial nations, to minimize imports, and to increase exports of finished products manufactured therefrom, have had the effect of diverting somewhat the flow of many essential mineral raw materials from primary to secondary sources of supply.

For example, according to Wirtschaftdienst Neue Folge XX, page 1217, of September 6, 1935, in 1935 there were 67 primary markets in which Germany formerly purchased most of its imports of ores and at prices relatively low, as compared with 57 such sources of supply in 1934; there were six primary markets in 1935 where purchases were made by barter or clearing agreements, as compared with 4 in 1934; there were 29 secondary markets or entrepots sources of supply in 1935, as compared with 15 such markets in 1934. For its essential imports of metals, there were in 1935 57 primary markets from which Germany formerly purchased a greater portion of required imports at relatively low prices, as compared with 90 such markets in 1934; there were 2 primary markets where purchases were made by barter, as compared with 1 such market in 1934; there were 43 secondary markets or entrepots sources of supply in 1935, as compared with 49 such markets in 1934. Of significance is the number of secondary and entrepots markets from which Germany is apparently purchasing a considerable portion of its essential ores and metals. These purchases from secondary sources, rather than directly from producing countries, enable the purchaser to bargain for greater consideration in its attempt to increase export sales of manufactured products. Obviously, however, costs of imported materials obtained in this manner must necessarily be at higher prices.

The unequal distribution of mineral raw materials, which necessitates imports of a few or many, by the major industrial countries of the world, would present no serious problem were it not for obstacles of an artificial nature that restrict free access to the logical sources of supply. These artificial barriers to free trade in essential mineral raw materials are of two types. The first consists of measures applied through Government enactments which limit the purchasing power of a country's industrial consumers, and the second includes those restrictions likewise the result of Government action which control and divert the international flow of mineral raw materials.

In classifying industrial nations with respect to their mineral raw material resources it is essential to distinguish between those minerals which are of primary and secondary importance. There are eight countries that consumed in excess of 85 percent of the principal industrial minerals during the years 1933-1936 (Belgium, France, Germany, Italy, Japan, Russia, United Kingdom, United States). Collectively these eight countries also produced a large percentage of world output of industrial minerals but individually they are and must continue to be, dependent on imports for certain minerals essential to the maintenance of their industries. Coal, iron ore, copper, and petroleum are absolutely essential to any nation that maintains a highly developed industrial structure. The eight countries mentioned during the years 1933-1935, inclusive, produced 85 percent and consumed 80 percent of total world coal production during that period; they produced 82 percent and consumed 93 percent of iron ore output; they produced 52 percent and consumed 85 percent of virgin refined copper production; they produced 72 percent and consumed 75 percent of crude petroleum output. The relative importance of all mineral raw materials cannot be determined with any degree of accuracy, but these four minerals are unquestionably most essential to present-day industry, and those countries which produce and consume a major portion of the world's output must be classified as major industrial nations.

The United States is best equipped by nature in its supply of minerals. A few commodities, such as tin, antimony, tungsten, etc., are not produced at all or in such limited quantities that for these products the country is dependent on imports. As a consumer of industrial minerals, United States ranks first among the industrial nations, and as a producer, with few exceptions, it is in a position second to none in its ability to provide its requirements from domestic sources of supply.

The Soviet Union is likewise well supplied with mineral raw materials. It also is deficient in a few essentials, such as tin, tungsten, sulphur, antimony, etc. The mineral wealth of the Soviet Union has not as yet been accurately determined and the more serious problem in its economic and industrial development at the present time is the inadequate supply of trained engineers, technicians, mechanics, and workers experienced in the operation of modern equipment.

With reference to the United Kingdom, coal is the only mineral of which it has an adequate supply. The British Empire as a whole, of course, is extremely well off in minerals, but from the angle of international trade the Dominions may be considered as foreign sources of supply.

France, including its colonies, is inadequately supplied with minerals having an exportable surplus, from domestic sources only, of iron ore and bauxite. During the period 1933-1935, for example, 24 percent of its apparent consumption of coal was imported; 98 percent of its crude petroleum consumption was imported; and for such minerals as pig tin, manganese ore, and refined copper its entire consumption of these raw materials during the period cited was imported.

To operate its steel industry, on which so many fabricating industries of the country depend, Germany can supply from within its own confines an adequate supply of coal only. During the period 1933-1935, 69 percent of its apparent consumption of iron ore was imported; 100 percent of its manganese was imported; with respect to pig tin, it likewise is entirely dependent on imports; 52 percent of its apparent consumption of crude petroleum during the period mentioned was imported; of outstanding significance, however, is Germany's position as the world's principal producer and consumer of aluminum despite the fact that during the period 1933-1935, 98 percent of bauxite, the basic raw material required in the production of aluminum, was imported. In addition to coal, Germany's production of potash is sufficient to meet its domestic requirements, but in practically every other mineral raw material imports are necessary.

Belgium, Italy, and Japan, including their colonies, in the order mentioned, are probably more dependent on imported mineral raw materials than any of the eight countries which collectively consume the major portion of the world output of industrial minerals. Although Belgium has produced since 1933 from 2 to 3 percent of the annual world output of coal, it nevertheless imported during the years 1933-1935, inclusive, 17 percent of its apparent consumption; likewise, in the case of iron ore, it produced slightly more than 3 percent of world output during the three-year period mentioned and was required to import 76 percent of its apparent consumption in order to maintain its steel industry. Aside from these two major industrial minerals, Belgium, exclusive of the Congo, is dependent on imports for its mineral raw materials.

Italy's resources of coal and iron ore are limited. It imported 93 percent of its coal consumption during 1933-1935 and 34 percent of its iron ore consump-

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† Foreign Minerals Division, U. S. Bureau of Mines.

tion during the same period. However, Italy has an exportable surplus of mercury, of which it is the world's second most important producer, and of sulphur, which as a producer it ranks next to the United States. It likewise has an adequate domestic supply of zinc.

The Japanese Empire is little better off than Italy in its domestic supplies of minerals. Its copper reserves are probably greater than any other Far Eastern country, but they are inadequate to meet its industrial requirements. During the period 1933-1935, 38 percent of Japan's apparent consumption of virgin refined copper was imported. Coal is the only primary industrial mineral of which Japan has ample reserves. Ninety-two percent of Japan's apparent consumption of crude petroleum during the period 1933-1935, inclusive, was imported; 80 percent of its pig tin requirements was imported; 63 percent of its manganese ore was imported, although Japan in the last few years has produced from 2 to 3 percent of the world output of this mineral so essential to its steel industry. Its reserves of iron ore are wholly inadequate to meet industrial demands. During the period 1933-1935, 79 percent of its apparent consumption of iron ore was imported from countries other than Japanese possessions.

Inadequate purchasing power of Continental European industrial countries, principally Germany and Italy, has, since 1933, brought about conditions affecting procurement of essential minerals from those sources which for years have produced an exportable surplus. International trade, in so far as total tonnage is involved, has responded to the increasing demand by the eight major industrial nations of the world during the years 1933-1936. The increase in world production and international trade in industrial minerals has been more rapid in the past four years than during the period immediately preceding the peak of 1929. This may be illustrated by citing a few examples. During the three-year period 1933-1935, inclusive, world production of aluminum increased 82 percent; during the three-year period 1927-1929, inclusive, world production increased 22 percent. During the period 1933-1935 world production of refined copper increased 42 percent, while during the three years ending 1929 the increase amounted to 28 percent. Iron ore production during the period 1933-1935 increased 52 percent, as compared with an increase of 15 percent for the period 1927-1929. Pig iron production increased 76 percent during the three-year period ending 1935, as compared with 14 percent during the period ending 1929.

World production of industrial minerals generally increased during 1936 to figures that will approximate world output in 1929 and, in several cases, notably manganese and crude petroleum, surpass the peak of 1929. During the industrial recovery since 1933 the aforementioned conditions affecting international trade are peculiar to this period and may be attributed to the unprecedented restrictions now imposed on the exchange of mineral commodities. In international trade of today, in so far as it concerns minerals, ordinary tariffs play a relatively unimportant part. With reference to many commodities, import tariffs may restrict the volume and block circulation in international trade, but with respect to mineral raw materials where import duties are applied primarily to stimulate domestic production, the total world volume of trade remains practically unchanged. The monetary and quantitative measures of restriction, introduced and applied more and more vigorously in recent years, have, like import tariffs, influenced very little the total world volume of international trade in minerals, but they have materially altered or diverted the flow and channels of trade.

For example, in September, 1934, Germany established trade control boards for ores and metals. These boards are authorized to establish consumption quotas, regulate the use of imported ores and metals for certain purposes by compelling substitution of materials (notably aluminum for copper). During the three-year period 1933-1935, 84 percent of Germany's consumption of virgin refined copper, amounting to over 574,000 tons, was composed of imports. During that period its domestic production ranged between 49,000 and 55,000 tons annually. In 1929 Germany imported 194.6 thousand metric tons of refined copper, of which 85.6 thousand originated in the United States. During the years 1932, 1933, and 1934 Germany imported 131.1, 154.6, 180.2 thousand metric tons, respectively, of refined copper, of which 21.3, 20.5, and 49.6 thousand metric tons, respectively, originated in the United States, but in 1935, with a total import of 153.3 thousand metric tons, Germany purchased only 16.5 thousand metric tons from the United States, and during the first 10 months of 1936, of 107.2 thousand metric tons of refined copper imported, only 5.9 thousand tons were credited to the United States. This decrease in direct imports from the United States is made up largely by increases from South Africa and Yugoslavia.

Germany's aluminum industry is dependent on imports of bauxite. During the three-year period 1933-1935, Germany's consumption of bauxite, amounting to approximately 1,000,000 tons of the raw material, enabled Germany to attain the position of world's largest producer of aluminum although 98 percent of the bauxite consumed was imported. During the period 1932-1936, inclusive, Germany's imports of bauxite increased more than 280 percent, or from slightly more than 200,000 tons in 1932 to 764,000 tons in the first 10 months of 1936.

In 1929, France, the world's principal producer and exporter of bauxite, supplied Germany with approximately 40 percent of the tonnage imported, while Yugoslavia, for example, furnished only about 17 percent; during the first 10 months of 1936 imports of bauxite into Germany from France represented only slightly more than 10 percent of total imports, while Yugoslavia contributed 22 percent and Hungary 32 percent.

These shifts in sources of supply are attributed to national policies which differ from country to country and from time to time in the same country, and there are intricate connections between governmental monetary and trading policies that influence international trade. In analyzing the causes of trends in trade during the past three years, it is necessary to consider as closely related subjects the problems of exchange control, import quotas, export restrictions, export premiums or subsidies, import surtaxes or so-called excise taxes, compensation agreements, and clearing and paying agreements, which, considered collectively, have become an integral part of present-day national policies of several countries.

Late in 1936 this Board of Control for Nonferrous Metals issued a new set of regulations, the salient feature of which is to prohibit the manufacture of such intermediate products as could serve for further manufacture into prohibited articles and machine parts. It is reported that in working out these regulations the board of control consults specialists in the various lines of industry affected in order that no specific prohibition is placed on the list unless it is certain that a serviceable substitute material is available to take the place of the prohibited metal. These restrictive regulations exempt goods intended for export. In the latest regulation restricting the consumption of nonferrous metals, those affected are copper, nickel, tin, lead, sheet zinc, and mercury, and the principal lines affected are the construction and machine industries. As an indication of a Government decree that may have far-reaching effects dependent on the actual administration of the act may be cited a new decree of the German Government, effective December 1, 1936, which imposes an obligation upon mining property owners to carry on mining, prospecting, or drilling operations when ordered to do so by the proper mining authorities. Rights to exploitation of a mining property, whether conveyed by the state or acquired by contract, expire when the lessee does not comply with an order of the authorities to commence or resume mining activity within a stipulated time. A new operator may be ordered by the authorities to take over the property and carry on the necessary mining operations. Orders and decisions of mining authorities within the scope of the new law are final and have no legal remedy. This new law is regarded as a measure within the present four-year plan intended to develop the German mineral and metal production to the maximum point attainable. It is reported that this act will not affect the potash industry, where numerous mines are kept inactive under cartel provisions. The chief purpose of the law is to overcome legal difficulties in cases where there is an urgent national interest in mining development of properties that have remained inactive.

With reference to mineral raw materials and the trade restrictions aforementioned, the situation may be summed up by directing attention to the fact that a few of the major industrial countries, principally Germany and Japan, whose huge fabricating industries are to a greater degree than other countries dependent on imports of mineral raw materials to maintain such activities, are at the same time equally dependent on export sales of their finished products to pay for the imported raw materials. Late in 1935, Italy likewise enacted measures for the regulation of mining activities and for the control of imported raw materials. The purpose of these measures, however, is primarily to insure an adequate supply of essential raw materials to consuming industries concerned, principally in the domestic market. Russia has already embarked on its second five-year plan and, as is well known, the state planning system, which is an integral part of the national Soviet Union's economy, is a plan which embodies control and regulation of the mining and mineral-consuming industries of the U. S. S. R.

France, to a lesser degree than the countries just mentioned, controls to some extent the import and export of mineral products as, for example, a decree passed in 1935 providing for the export of bauxite under license only, and decrees regulating through licenses and quotas the importation of petroleum products. Belgium, the infant in the family of eight major industrial nations, which, like the United Kingdom, is dependent on overseas sources of supply for most of its mineral raw materials, utilizes tariffs to control the sources of such raw materials.

The United States, through tariffs, has to some degree restricted the importation of certain mineral raw materials, but on the whole production and foreign trade in mineral raw materials is conducted without governmental restrictions. Conservational measures have been introduced in certain instances; for example, in connection with petroleum and as proposed in the case of bituminous coal, but such measures are not comparable to controls adopted by other industrial countries. During 1936 the world was confronted with two conflicting methods of conducting international trade; the first, promotion of foreign trade with tariffs only as regulatory measures restricting such trade, and with the initiative left with individuals for the promotion and development of trade. The reciprocal trade agreement program of the United States, approved on June 12, 1934, and the agreements with 14 countries which were in effect in December, 1936, represent effort made in this direction. In the opposite direction there has been a decided tendency to adopt bargaining measures centralized in the National Government, such as import quotas which tend to restrict or abolish trade with certain countries, export subsidies which facilitate the sale of manufactures in world's markets and thus enable to some degree the exporting country to acquire essential raw materials, exchange regulations, clearing, and compensation agreements which enable the central Government to control more or less the countries with which its nationals trade. The tendency toward adoption of this method of conducting international trade is perhaps developed to a greater degree in Germany and Japan than elsewhere.

GOLD MINING Near Washington, D. C.*

ALTHOUGH the gold production of the seven states that comprise the Southern Appalachian region is a fraction of that of any one of the Western States, the figures for 1936 released by the United States Bureau of the Mint reveal an increase for Alabama, Maryland, and Virginia. Maryland records a total of 600 ounces and is listed for the first time in many years, and Virginia shows a fair gain. It is with these two states that we are concerned because we have several times visited the mines that produced the gold. Two of them are within 30 minutes' drive of Washington and the third is two hours distant in an historic district.

Virginia

1. Near the Rapidan River, Wilderness, Orange County, is the Vaucluse Mine of the V-M Corporation, in charge of C. E. Bass. A quartz and schist lode in schist has been developed to depth of 320 feet. Mineralization is not heavy. The workings are wet about 500 gallons a minute. A fair tonnage of ore is opened. Timken detachable bits are being tried on drifting machines. In quartz they will drill only a few inches, but in schist several feet Solid steel is used on stoping machines. The mine is equipped with 750 and 500 cubic foot compressors, hoist, head-frame, ore-bucket, and pumps, and produces 70 tons or more a day.

Headframe at Maryland Gold Mine.

At present, the ore is trucked a short distance to the mill. This consists of crusher, sorting belt, Hardinge mill, Dorr classifier, and Fagergren flotation machines. A 92 per cent. recovery is made and dried concentrates are shipped to New Jersey. It is proposed to move the mill close to the mine. (Continuation of trucking or aerial tramming is worth consideration).

2. Near the Potomac River, Arlington County, the Virginia Mining Company is in the developmental stage, but it has a mill of 35 tons capacity. George Kirke is in charge. A shallow shaft and two adits have been put in. Water is said not to be troublesome, although the shaft is alongside a creek. The ore is heavily mineralized and shows some free gold. All of the timber used in mining and building is cut on the property, which is hilly.

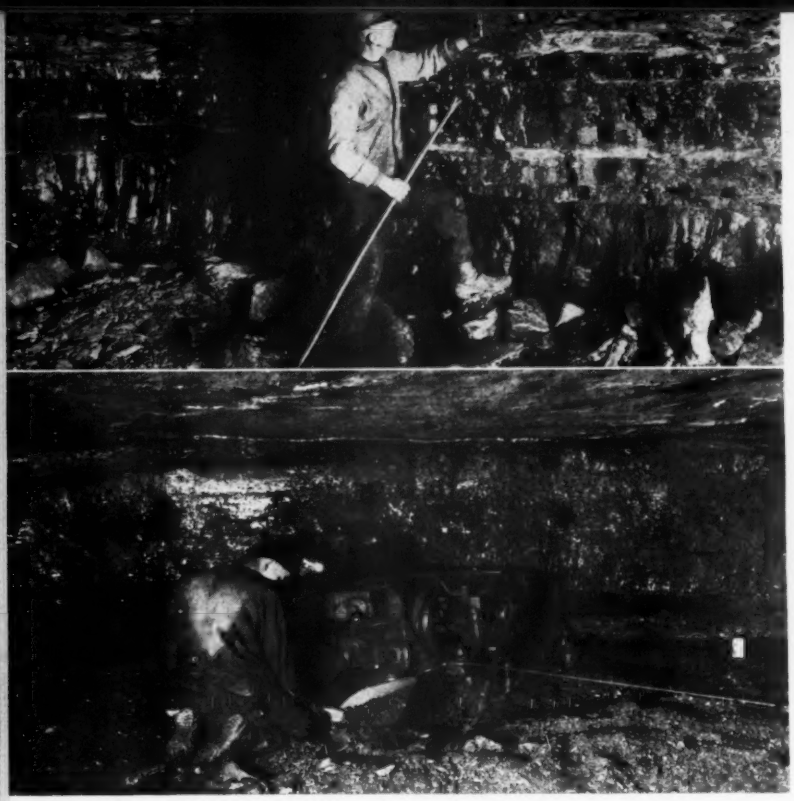
The plant is on a hillside and consists of jaw-crusher, and Denver Equipment ball-mill, jig, copper plates, flotation machines, concentrating table and amalgamating barrel. Some difficulty is experienced in amalgamating the gold. Dried concentrates are to be shipped.

Maryland

Not far from the Great Falls of the Potomac River is the property of the Maryland Mining Company, with O. R. Turner in charge. Its output last year accounted for Maryland's reappearance in the list of State gold producers. The mine has been worked intermittently since the Civil War. A year or more ago it was unwatered and equipped at considerable expense. It is 210 feet deep, but sinking is contemplated, and should be worth while. The vein is essentially quartz in schist, with makes of schist, and dips 65 degrees. It ranges from 2 to 12 feet in width and a fair tonnage is exposed. The workings are wet—up to 50 gallons a minute. Mineralization is slight and galena is the indicator, as it is in several districts of the United States, and other parts of the world. Some gold is found in the quartz and schist but the rich pockets occur where galena runs to cross fractures in the quartz. Coarse gold on galena is colorful. Mass gold is freed of quartz and sent to the Mint. Crucible and Timken detachable bits are on trial, but only a few inches per bit are drilled in quartz.

The 10-ton mill is really for sampling and is not a gold-recovery plant. It consists of a jaw-crusher, Straub 10-stamp circular mill using 7½ horsepower and fed with ¾-inch ore, copper plates,

* Contributed.



Top—Testing for Gas. Below—Cutting Coal.

and Deister table. The concentrates are rather low grade. More than 1,000 tons of ore was milled last year. The gold is 950 fine.

POCAHONTAS FIELD

By W. E. E. Koepler*

THE Pocahontas situation for 1936 has turned out to be one of the most disappointing in years in many respects excepting the tonnage produced and that is not up to capacity. If the expression "profitless prosperity" had not been worn out it would fit the situation. During the year hopeful signs recurred many times to encourage the operators but the price situation principally laid these low before they materialized. The situation was even such as to retard the progress along mechanical lines that usually characterizes the Pocahontas Field where so many innovations have had their beginning. However, the dissatisfaction over the year's record has undoubtedly bred a feeling of determination in the minds of the operators which justifies the prediction that it will not happen again soon.

The production will be in the neighborhood of 27,000,000 tons while the tonnage of such good years as 1926 and 1929 was in the neighborhood of 30,000,000 tons. A larger tonnage than this is possible, though I recall being told that the peak had been reached in 1916 when we ran 24,942,000 tons. The increase of 1936 over 1935, when we shipped 21,728,172 tons, while material, is not up to the increases made in the closely competitive smokeless coal fields. Various factors considered, the tonnage was not even satisfactory.

Perhaps the most satisfactory trend in the Pocahontas coal field is toward larger production units by combining mines and concentration of working areas. This tendency began in 1929 and showed its principal development prior to 1935, but 105 Pocahontas mines in 1929 shrank to 78 mines in 1935 and 77 in 1936. A few of these mines were exhausted and in the present year a few more will go the same way. Double and triple shifting had much to do with this progress and this is the result of the short hour day and short week. The short day has been proven unsatisfactory in many ways and has now developed a labor shortage aspect that should end the experiment and bring back the more normal eight-hour day. There is a shortage of all classes of men in the Pocahontas Field. There are not even many unemployables willing to work and therefore there is practically an end of the relief situation here. The low number of men employed here was in July, 1933, when we had 16,557 men whereas the present rolls contain just about 26,000 men. There has been no slacking on the re-employment program here, but a number of factors are now presenting difficulties the principle of which is that of housing, which is up to its limits, and even bus transportation has reached its end of feasibility. The labor factors have got to have some practical handling as a whole in 1937.

Preparation practices have not changed much except to try to handle the inferior workmanship by the miners by increasing tipple facilities. This has not been complicated by mechanical loading in the mines as we have practically none of it. There has been a shifting from calcium chloride for dustless treatment, to oil methods, the latter now having the majority. Shifting markets caused by maladjustments of freight rates, truck transportation, competitive fuels and general industrial conditions have caused many problems especially in the preparation end of the business and current changes have been the rule. These unsettled conditions will apparently continue for another year though many efforts will be made to adjust them and much progress will occur.

The associations have been very active as centers where the operators have assembled almost continuously for the purpose of keeping informed on the developments pertaining to legislation, labor, markets and the thousand and one new and old complications in the coal business that have come to the front this past year. The association idea in American business has been the one anchor of stability that makes the outlook more favorable than many other forecasts justify, but on the whole and for the long pull the outlook does appear more promising than a year ago.

* Secretary, Pocahontas Operators Assn.

COAL IN COLORADO

By H. C. Marchant*

THE year 1936 closed with the coal industry in Colorado on the up-grade, and while final figures are not yet available, indications are that the total production for the year 1936 will be approximately 6,500,000 tons, as compared with 5,250,000 tons produced in 1935, an increase of approximately 24 percent. However the 1936 production is considerably below the production in the late twenties, when the annual production reached 11,000,000 tons.

The consuming markets reached by Colorado have been invaded by substitute fuels, largely gas lines and fuel oil, and it is a little problematical whether or not Colorado will attain an annual production of 10,000,000 tons in the near future.

Inasmuch as the territory served by Colorado coals is highly a domestic market, and a minimum of industrial activities, with the possible exception of the

* Secretary-Treasurer, The Rocky Mountain Coal Mining Institute.

steel mills at Pueblo, this increase has been absorbed by the domestic consumer, who, as the result of increased prices in farm products and cattle, has been in position to purchase considerably more coal than during the years of the depression.

The following table shows the men employed, days worked, and the number of mines operating in 1936, compared with 1935:

	1935	1936
Tons produced.....	5,250,000	6,500,000
Men employed.....	8,322	8,760
Days worked.....	124	175
Number of mines..	359	253

There has been an increase in the number of men employed, but the marked increase is in the number of days worked, and this increase has been quite beneficial to the mine workers in Colorado.

Considerable advancement has been made in mine-rescue and safety work under the leadership of Thomas J. Allen, state coal mine inspector, and while it is a little early to measure the improvement, present records indicate that fatalities and injuries during 1936 are not above the average.

Extreme cold weather was experienced the latter part of January and during February, 1936, and a substantial portion of the increased production was produced during the first two months. However, the balance of the year shows a substantial increase over the same period in 1935.

In looking to the future, indications are that the year 1937 should be as well, if not better, than 1936, and when we consider the installation of coal stokers, both industrially and domestically, which has been going on in the past two and three years, it may be concluded that the inroads of substitute fuels have reached their maximum.

THE BIG SANDY FIELD

By H. S. Homan*

THE year 1936, for the Big Sandy coal field, was uneventful from all angles. The tonnage produced was approximately 15 percent above that of the previous year, which is slightly less than the gain shown by the entire bituminous industry. This is accounted for in the loss of production by Pittsburgh Coal Company's Pike-Floyd mine account fire July 13 which completely destroyed the tipple; loss of 15 days' time by Elkhorn Coal Corporation mine account damage to tipple by fire; abandonment of mine by Autocrat Coal Company in March, 1936, and also loss by several small companies due to unfavorable market conditions.

The lake cargo business, which was unusually good due to demand and favorable weather conditions, was enjoyed by the Big Sandy field in proportion to other lake shipping fields. The condition of coal handling equipment, and railroad car supply of the Big Sandy Division of the C. & O. Railroad has been everything that the operator could ask for. There has been no car shortage and no losses due to poor condition of rolling stock or road beds.

Nineteen hundred thirty-six saw no vicious labor difficulties in this field and while there was some lost time due to illegal strikes, it could be mostly attributed to misunderstanding and unfamiliarity with contracts on the part of labor in this field.

Only one gas explosion was exprienced, which cost the lives of nine men. Safety, first aid and mine rescue programs were not only maintained, but enlarged and improvement shown. The Big Sandy-Elkhorn Coal Operators Association within the year has sponsored the maintenance of a full-time safety and rescue instructor, and the employes generally have taken to this work enthusiastically.

Nineteen hundred thirty-six saw the introduction into the Big Sandy field of a 100 percent mechanical mine, operated with Joy loaders and conveyors from loading machine to the railroad car. It also witnessed the beginning of construction, which is progressing rapidly, of the most modern tipple in the industry. This tipple will handle the production of a hand loaded, car equipped mine, and a hand loaded, conveyor equipped mine, with a combined hourly capacity of 500 tons, which, due to flexibility secured through conveyors, elevators, bins and screens, produces sizes, preparation and combination of sizes to fill any present requirements of the stoker industry, which are the most varied of any specialty coal yet demanded of the coal industry. The entire production of the mine can be run on stoker preparation for all standard sizes from 6-in. lump to ⅜-in. nut, and can be blended to fill any specifications between these sizes. There is a novel arrangement on this blending bin so that the resultant product is uniformly oil treated, as are all sizes and grades if shipped separately. The life of this mine is 35 to 40 years, at maximum capacity, and will be one of the mainstays of production for this period. Two other large producers of the field have modernized and improved their plants within the year to maintain their position as leaders in preparation, efficiency, cost and quality, and it is expected that another modern all-steel and concrete tipple will be erected in 1937 to serve a mine of 2,000 tons daily capacity, operated entirely by loading machines and conveyors.

All plans and specifications are complete for submission to contractors for a river tipple, to be located between the cities of Catlettsburg and Ashland, Ky., at the mouth of the Big Sandy River, which will be capable of handling the entire production of the Big Sandy mines on the C. & O. Railroad, for rail-river shipments. This work is expected to be started as early in the spring of 1937 as water conditions will permit.

While a very considerable part of the tonnage of this field, during the year 1936, was operated under receivership or trusteeship, it is expected that 1937 will see the return of management entirely to the operating companies.

* Secretary, Big Sandy-Elkhorn Coal Operators Association.

IOWA COAL INDUSTRY

By Geo. Heaps, Jr.*

ANYTHING that may be said of the Iowa coal industry in 1936, I imagine, might be as easily said about almost any other producing district in the country, large or small.

The story of the first two months is a story of lessened production due to weather conditions which slowed up operations at the mines and on the railroads to such an extent that in the face of an unprecedented demand for coal, the existing facilities for production and distribution were wholly inadequate.

This is not to be wondered at when we realize that here in a small market almost a million tons of coal were produced at hillside mines. The story of the operation of these mines is doubtless the same elsewhere as in Iowa. They pay no wage scales, observe no regular hours of work, disregard all laws that must be lived up to by any responsible operator, and sell their product at any price a buyer will pay at the moment of sale. Last winter when the blizzards howled for days on end and the demand for coal grew hourly, these mines that had been supplying a great part of the domestic market simply folded up leaving the entire burden upon the substantial mines with no time whatever in which to prepare to produce the additional tonnage needed. This condition naturally brought down criticism upon the heads of those producers, and miners as well, who were in the front lines fighting the battles against snow and cold.

In 1936 Iowa produced more coal than for several years back, but a smaller percentage of our production was hauled by railroad than at any time in our history. Thousands of trucks roll over our highways day and night bringing coal to market from these hundreds of small mines scattered throughout the entire coal mining region of Iowa. Numbers of these truckers are men who have been barely able to make a down payment on a used truck and are not responsible either financially or personally.

The situation here in Iowa has resolved itself down to the place where the responsible part of the industry, operators and employes as well, must join

* Vice President, Rex Fuel Co., and Secretary, Iowa Coal Operators Association.

forces in an effort to modernize our operations, wherever possible, so that Iowa coal may again be marketed through the regular channels of retail distribution, which after all seems to be the most orderly system yet invented, or they must step aside and turn the industry over to the small mine operator and the trucker. As conditions are today, a dealer cannot buy Iowa coal by the carload, store it and distribute it in small lots to the consumer when during the coal season trucks of coal for sale are standing on the streets in practically every town within 150 or 200 miles of the mining district.

This mention of the trucker in connection with the present conditions does not mean that the shift from rail movement to highway movement has not been a step forward in distribution. In a prairie state such as Iowa covered by a network of superb paved roads, use of those highways for freight haulage is as inevitable as progress itself. However, this branch of distribution must be placed on an organized orderly basis if it is to be of any permanent benefit to the Iowa coal industry.

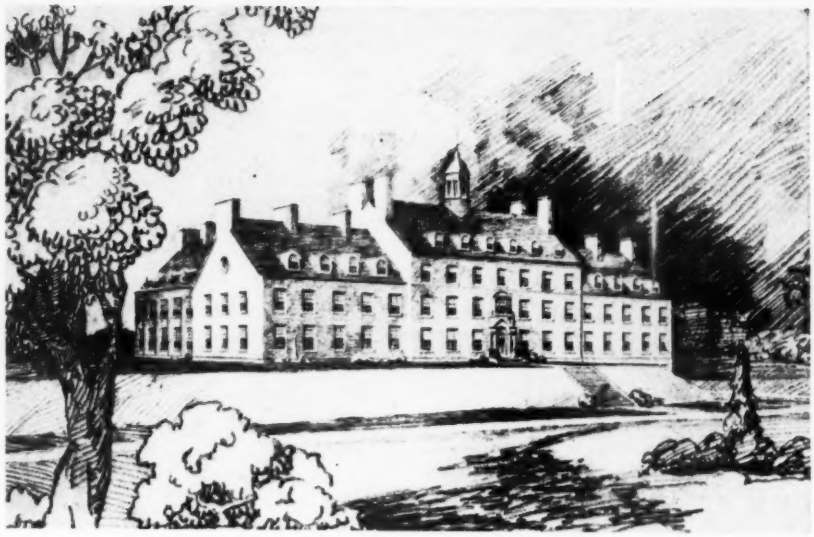
The attempt to correct the conditions described above, is in my opinion, the chief task ahead for the industry in 1937. These conditions can be corrected only through cooperation between the mine operators who try to produce coal by modern methods, obeying safety laws and paying fair wages, assisted by the several thousand men who are still able to find at least part-time employment at their mines.

New Buildings for U. S. Bureau of Mines EXPERIMENT STATIONS*

By O. C. Ralston† and A. George Stern‡

THE depression dealt severely with the U. S. Bureau of Mines in some ways, but as a result of the Public Works program, which grew out of the depression, three fine new experiment station buildings have been erected at Tuscaloosa, Ala., College Park, Md., and Bartlesville, Okla., for the Bureau's research designed to aid the mineral industries. All of these buildings are of brick and concrete construction, with enameled or spray-glazed hollow-tile partitions, which were chosen for low maintenance cost and ease of cleaning.

The new building at Tuscaloosa, which houses the Southern Experiment Station, occupies a 2½-acre tract that was deeded to the Government, on the campus of the University of Alabama.



Eastern Experiment Station, College Park, Md.

Petroleum Experiment Station, Bartlesville, Okla.

The Public Works Administration allotted $200,000 to the Bureau of Mines for the construction and equipment of the building, which is 50 ft. wide and 159 ft. long, with a floor space of 23,250 sq. ft., including a 40 x 60-ft. one-story annex. Coal, iron ore, clay for mineral fillers, bauxite, phosphate rock, graphite, gold ore, and kyanite are among the resources of the Southern States that are being studied. The station is administered through the Nonmetals Division of the Technologic Branch of the Bureau, and deals principally with the beneficiation of southern minerals. Like all other Bureau stations, the work on a special problem extends to minerals from other regions, and the results may be applied to the entire country.

As shown in the photograph, the Tuscaloosa building has two floors with attic and basement. Good equipment is available in reasonably adequate amounts, and there is abundant space for installation of additional machines and apparatus when they can be used to advantage. The dedication of the building on May 26, 1936, was attended by many people interested in the mineral industry, who filled the small auditorium and overflowed to the lawn outside, and listened to the ceremony through a loudspeaker system installed for the occasion.

The Tuscaloosa station is understaffed, only a nucleus having been left as a result of cuts made during the depression. Slight restoration of normal funds has been made and it is hoped that the coming year will help further to put the southern experiment station back into a scale of operation that can be more effective.

At College Park, Md., the eastern experiment station, on a 20-acre tract deeded by the State of Maryland to the Federal Government, is nearing completion and should be ready for occupancy by late March. This new building, with 65,000 sq. ft. of floor space, is larger than that at Tuscaloosa and will cost $350,000, not including equipment (which was included at Tuscaloosa). It consists

* Published by permission of the Director, U. S. Bureau of Mines. (Not subject to copyright.)
† Chief Engineer, Non-Metals Division, U. S. Bureau of Mines.
‡ Assistant to Chief, Technologic Branch, U. S. Bureau of Mines.

of a U-shaped building, having a central portion (110 by 52 ft.) of three stories and a basement, with two wings (each 112 by 50 ft), which will have two stories. Ducts have been installed for circulating conditioned air, but funds have not yet been provided for the air-cooling machinery.

College Park is close to the District of Columbia, requiring less than an hour of travel from the Bureau of Mines headquarters. The nonmetals experiment station at New Brunswick, N. J., which has operated in rented quarters, will be moved to College Park and will be the principal occupant of the new eastern experiment station. In addition, laboratories are available for special research problems under the immediate supervision of division chiefs headquartered in Washington.

The functions of this eastern experiment station are not entirely regional. However, nonmetallic minerals are produced in great quantities east of the Mississippi River, especially in the Appalachian Mountain area, so it is fitting that the major emphasis in the eastern experiment station should be on nonmetals. Dedication of the College Park building will take place early in the fall of 1937.

The new structure at the Bartlesville Petroleum Experiment Station occupies a 5-acre tract of land and augments buildings that were donated to the Bureau of Mines by the Bartlesville Chamber of Commerce and the late George B. Keeler in 1918. In subsequent years the work of the station outgrew its original quarters and spread into inadequate temporary structures. In September, 1935, an allotment of $250,000 was made by the Public Works Administration to the Bureau of Mines for new construction and equipment at Bartlesville, and in January, 1937, $19,500 was added to that allotment.

As a result of this Public Works project, the main building at Bartlesville now consists of a new central section facing west (100 ft. long, north and south, by 50 ft. wide) of three stories and basement, a new north wing (57 ft. long, north and south, by 37 ft. wide) of two stories and basement, and a similar south wing made by reconditioning and reroofing the original office building to match the remainder of the structure. All the new space, which will be occupied in February, 1937, is completely equipped for air-conditioning, and provision is made for extending the system to include the south wing.

The Bartlesville station, operated under the Petroleum and Natural Gas Division, is the Bureau's largest center of research relating to production, transportation, and refining of petroleum and natural gas. Its activities and influence are widespread, as it cooperates closely with other stations and offices of the division at Dallas and Amarillo, Tex., Laramie, Wyo., and San Francisco, Calif., in serving the entire nation in matters relating to oil and natural gas.

MINING SHOWS ADVANCEMENT

STEEL Industry Shows Increased Employment and Wage Records

Iron ore productions (exclusive of ore containing 5 percent or more manganese) increased 59 percent in 1936 with a gross tonnage of 48,618,000 gross tons. Production in 1936 was the largest since 1930. Ore shipped from mines in 1936 is estimated at 51,380,000 gross tons carrying a value of $130,777,000. The average value of the ore per gross ton at the mine in 1936 is estimated at $2.55. Stocks of ore at mines at the end of 1936 were 5,256,000 gross tons a decrease of 33 percent over the stocks held at the end of 1935 and were the smallest since 1907. Lake Superior district furnished about 86 per cent of the iron ore shipped. The Birmingham district mined approximately 4,125,000 gross tons, an increase of 25 percent over 1935; the Northeastern states mined 2,045,000 gross tons, an increase of 52 percent over 1935; Western states mined and shipped 706,000 gross tons.

For 1936 it is estimated that the steel industry net earnings will amount to approximately $150,000,000 representing a return of 3 percent of invested capital. According to Walter S. Tower, executive secretary of the American Iron and Steel Institute,, "improvement in the steel industry during 1936 lifted production to the largest quota since 1929, while number of employes and wage rates reached the highest point in the industry's history . . . steel mill activities steadily advanced throughout the year. The operating rate for the first quarter was close to 55 percent of capacity moving up to 78 percent in the final quarter."

COPPER Industry Shows Steady Improvement

According to the United States Bureau of Mines marked improvement was apparent in many phases in the copper industry in 1936. Smelter production was 61 percent higher than in 1935 and refinery production was 81 percent higher. They estimate that foreign trade in copper will show decreases of probably 30 percent in imports of unmanufactured copper and of more than 10 percent in exports of metallic copper. Primary metal increased its consumption 46 percent.

According to the Copper and Brass Research Association the industry enjoyed by far the best year since 1929. B. B. Caddle, secretary, said, "The outlook for 1937 is most encouraging." Domestic copper sold at 12 cents a pound, on the last day of the year which was the highest level since December, 1930 . . . fabricating plants of the country operated most of their departments at between 85 and 87 percent capacity during the latter part of 1936 and it is reasonable to believe that the sales total for 1929, which was the peak year since the signing of the armistice, will be exceeded in 1937." C. Donald Dallas, president of Revere Copper and Brass, Inc., stated that, "The statistical position of the red metal is so strong that it has changed from a buyers' to a sellers' market, with producers occupying the unique position of trying to keep prices within reasonable bounds yet being unable to meet all demands of buyers." The Navy Department in a recent statement indicated that the Department faces one of the most active peace time years with admitted shortages of steel and copper. With the regular building program under way and with all indications that keels of two new battleships will be laid in 1937 Navy officials were deeply concerned about the possibility of obtaining materials. The Department has asked for bids for an approximate total of 27,000,000 pounds of steel and for 2,600,000 pounds of copper.

Southern Experiment Station, Tuscaloosa, Ala.

GOLD and SILVER Progress

Reviewing the silver market for 1936, Messrs. Handy and Harman, Bullion Dealers and Refiners of New York and Bridgeport consider the year an exceptionally quiet and uneventful one, a condition reflected by unusually narrow market fluctuations. There were three mild flurries but these were of short duration. World production of silver at 253,000,000 ounces showed a gain of 16 percent. This production was divided as follows: United States, 64,000,000 ounces; Mexico, 82,100,000 ounces; Canada, 19,200,000 ounces; South America, 31,400,000 ounces, and all other countries 56,300,000 ounces. The United States ranked a close second on the percentage basis but led all other countries in volume of increase by producing 15,000,000 ounces more than in 1935; Idaho, was again the largest silver producer presenting a new record of 14,400,000 ounces.

It is estimated that the world's gold production in 1936 is 34,000,000 ounces which is approximately 5,000,000 ounces greater than 1935 production. The three largest world producers of gold were, South Africa, the United States and Canada. Moscow reported that Russian gold output for 1936 was 26 percent higher than 1935.

GOLD and Geography

Last year, the gold production of the Philippine Islands approximated 600,000 ounces fine, an increase of 170,000 ounces and placed that country second among the producing States and Territories. California was first with 1,043,000 ounces, South Dakota third with 589,000 ounces, and Alaska fourth with 511,000 ounces. Alaska is part of the mainland of North America, but is it correct to include the Philippines in the United States' total of 4,313,000 ounces when the islands are several thousand miles distant, actually in Asia? Philippine gold is mined mainly by American capital and the bullion is ours, yet it is not United States production. This line of reasoning was recently brought to our attention and we believe that it should be considered by statisticians.

Alaska Copper Production

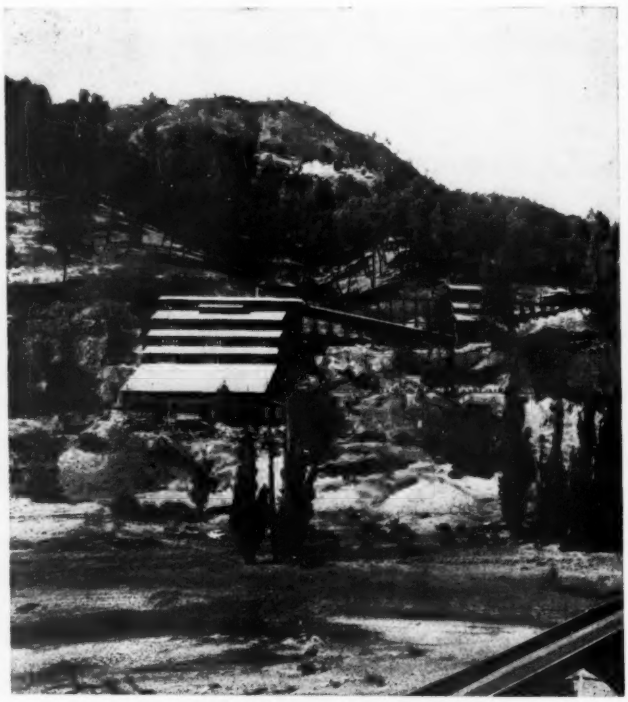
Alaska produced 39,740,000 pounds of copper in 1936. This is an increase of 35,000,000 pounds over 1935. The bulk of the production came from mines near Kennecott.

BLAST FURNACES Active

On January 1, 1937, 170 blast furnaces were active in the United States. This represents 65.9 percent of the total of 258 available.

Annual Figures of FERROUS SCRAP Consumption Now Available

Producers, marketers, and consumers of scrap iron and steel, together with iron ore producers and students of broader problems in economics should welcome a new statistical service being performed by the Economics and Statistics Branch of the U. S. Bureau of Mines, namely, the release of reliable figures showing annual consumption of ferrous scrap and pig iron. Initiated after repeated requests from industry, the new service supplies actual figures which have long been needed to improve our knowledge concerning raw material supplies and demand in mineral industries.



Gold Mining in California.

Figures for the year 1935 just released in the form of Report of Investigations No. 3329, Mineral Economics Series 1, show in detail consumption of ferrous scrap (subdivided into home and purchased categories) and pig iron in various types of furnaces by districts and states. Thus, in addition to gauging the actual flow of these basic raw materials into steel plants and foundries for the entire country and its constituent parts, the figures reveal variable averages in practices of charging metalliferous raw materials into different types of furnaces in specific areas, practices which differ greatly. If, as is hoped, this survey is continued permanently on an annual basis, important trends in these practices over a period of years will thus be made available.

Producers of raw materials other than iron ore should find an interest and use in these figures, since one ton of reclaimed steel scrap takes the place, roughly, of a little less than 2 tons of iron ore, from ¾ to one ton of coke, and ½ ton of limestone. Annual utilization of millions of tons of scrap thus displaces from three to four times as much mineral raw materials which otherwise would have gone into the production of an equivalent amount of pig iron. Collection, preparation, and distribution of these huge quantities of scrap thereby assumes an important position in the general conservation movement.

Recent years have seen more and more attention being focused on the importance of scrap and secondary metals in the economics of metal industries. Any studies pertaining to the vitally important subject of future supply and demand of minerals must necessarily include careful appraisal of supplies and probable consumption of waste metals coming back either from normal manufacturing processes or from the junk heap of old products discarded after having served their useful purpose. Expansion of the Bureau's annual statistical service on scrap and secondary metals to include figures on ferrous scrap consumption thus permits more accurate gauging of the importance of these factors, and is most welcome, therefore, to the mining and metal industries.

MINT RECEIPTS

A 12 percent increase in gold receipts at the Denver Mint for the first 11 months of 1936 over 1935 receipts, has been reported by the superintendent of the Mint. This is 30 percent larger than for the same period in 1934. $55,610,704 in gold was received by the Mint in the first 11 months of the year. It is also interesting to note that the percentage increase in newly mined gold received at the Mint during 1936 is greater than the increase in total gold receipt.

LEAD and ZINC

Output of refined lead from domestic ores increased 23 percent and total refinery production increased 21 percent. Domestic zinc consumption in 1936 increased 21 percent over 1935 and both the lead and zinc industries look to further improvement in 1937. Ernest V. Gent, secretary of the American Zinc Institute, Inc., in his annual statement asserted that the improvement noted at the end of 1936 promised better times of the zinc industry as 1937 began. Production of slab zinc was 425,371 tons. The monthly consumption average for 1936 was approximately 47,000 tons. In commenting upon the tri-state district Mr. Gent said, "The tri-state district of Oklahoma, Kansas and Missouri operated with a slightly higher number of mills during 1936 . . . unsold stocks of zinc concentrates at the end of 1936 approximated 12,000 tons. Production of zinc concentrates has held steady at approximately 9,000 tons per week. The price fluctuated from $32 during the first six months of the year to $35 by the end of the year."

COLORADO Metal Production Increases

Reports from companies producing minerals in Colorado indicate that the production of gold, silver, copper, lead and zinc greatly increased in 1936. Colorado produced 364,713 ounces of gold; 5,814,119 ounces of silver; 17,578 pounds of copper; 13,657 pounds of lead; 2,511,000 pounds of zinc. These figures are based upon releases from the United States Bureau of Mines and were compiled by Charles W. Henderson and A. J. Martin of the Denver office.

SLAB ZINC STATISTICS (ALL GRADES) 1929–1936

Tons of 2,000 lb.

	(1) Stock at Beginning	(2) Production	(3) Total Item (1) plus Item (2)	(4) Shipments	(5) Stock at end	(6)* Shipped for export	(7) Retorts operating end period	(8) Average retorts during period	(9) Unfilled orders end of period	(10) Daily average prod.
1929	46,430	631,601	678,031	602,601	75,430	6,352	57,999	68,491	18,585	1,730
1930	75,430	504,463	579,893	436,275	143,618	196	31,240	47,769	26,651	1,355
1931	143,618	300,738	444,356	314,514	129,842	41	19,875	23,099	18,273	822
1932	129,842	213,531	343,373	218,517	124,856	170	21,023	18,560	8,478	583
1933	124,856	324,705	449,561	344,001	105,560	239	27,190	23,653	15,978	890
1934	105,560	366,933	472,493	352,663	119,830	148	32,944	28,887	30,786	1,004
1935										
January	118,005	35,135	153,140	35,455	117,685	0	32,658	32,230	25,993	1,133
February	117,685	33,468	151,153	34,877	116,276	33	33,210	33,157	25,816	1,195
March	116,276	36,735	153,011	41,205	111,806	0	35,196	32,535	20,000	1,185
April	111,806	35,329	147,135	38,455	108,680	3	33,719	32,450	22,435	1,178
May	108,680	34,572	143,252	35,627	107,625	23	32,389	30,387	35,878	1,115
June	107,625	34,637	142,262	29,353	112,909	0	33,836	31,230	26,967	1,155
July	112,909	35,120	148,029	32,306	115,723	0	33,884	31,244	36,939	1,133
August	115,723	35,547	151,270	38,824	112,446	0	32,942	30,482	39,238	1,147
September	112,446	36,221	148,667	42,351	106,316	0	34,870	32,445	47,080	1,207
October	106,316	36,716	143,032	47,063	95,969	0	34,777	32,934	47,367	1,184
November	95,969	37,469	133,438	48,172	85,266	0	36,650	33,868	59,453	1,249
December	85,266	40,550	125,816	42,058	83,758	0	38,329 34,298†	35,126 33,896†	51,186	1,308
		431,499		465,746		59				
Monthly average		35,958		38,812		5		32,341		1,182
1936										
January	83,758	41,917	125,675	46,468	79,207	0	38,205 34,291†	35,872 34,358†	42,219	1,349
February	79,207	36,228	115,435	39,918	75,517	0	38,004 33,726†	34,334 32,456†	56,829	1,249
March	75,517	42,483	118,000	38,159	79,841	0	37,922 33,849†	36,189 34,516†	41,638	1,370
April	79,841	43,252	123,093	42,311	80,782	0	41,400 36,657†	37,778 35,749†	35,968	1,442
May	80,782	44,905	125,687	43,977	81,710	0	41,048 36,919†	37,888 36,296†	28,370	1,449
June	81,710	44,947	126,657	41,654	85,003	0	40,700 36,934†	38,176 36,972†	27,090	1,498
July	85,003	45,553	130,556	41,891	88,665	0	41,308 37,350†	38,135 36,734†	44,458	1,469
August	88,665	43,614	132,279	46,085	86,194	0	41,308 37,418†	38,358 37,006†	65,173	1,407
September	86,194	42,283	128,477	51,847	76,630	0	40,672 36,843†	38,326 36,897†	54,064	1,409
October	76,630	46,297	122,927	54,035	68,892	0	41,733 38,052†	39,157 37,893†	60,513	1,493
November	68,892	45,742	114,634	57,107	57,527	0	43,103 38.607†	40,125 38,588†	75,891	1,525
December	57,527	47,050	104,577	59,821	44,756	0	42,965	40,642	78,626	1,518
		524,271		563,273		0	38,461†	38,538†		
Monthly average		43,689		46,939				37,915		1,432

* Export shipments included in total shipments Item (4).
† Equivalent retorts computed on 24-hour basis.
American Zinc Institute, Inc., 60 East Forty-second Street, New York, N. Y.

BITUMINOUS and ANTHRACITE on Upgrade

Bituminous coal made rapid strides in 1936, ending the year with a production of 430,000,000 tons which is approximately 60,000,000 tons greater than 1935. This production, however, is still a hundred million tons below the 1929 record. Experts predict that production will reach approximately 500,000,000 tons in 1937. Production in 1935 was 369,000,000 tons; in 1934, 354,000,000 tons; in 1933, 333,000,000 tons and in 1932, 309,000,000 tons. The bituminous coal industry is entering 1937 with a better prospect and outlook than in many years,

Anthracite coal gained in production about 15 per cent over its 1935 record. This industry has carried on an aggressive campaign to counteract the inroads of competitive fuel into its market. It has also been successful in arousing national interest in the bootleg coal situation.

The order of the Interstate Commerce Commission which eliminates emergency freight surcharges it is estimated will remove nearly $40,000,000 annually from the cost to consumers for anthracite and bituminous coal. However this gain is jeopardized by the petition of the railroads for increase in basic rates. Possibilities for labor difficulties at the expiration of the present wage scale on April 1 are serious. The industry is also faced with another effort to bring, the bituminous industry at least, under Government control through some such legislation as proposed in the Guffey Act.

TIN Control Plan

According to the *Wall Street Journal,* through their London correspondent, terms of the new International Tin Control Scheme were presented. The plan provides a period of operation from January 1, 1937 to December 31, 1941 with the following standard tonnages: Belgian Congo, 13,200 tons; Bolivia, 46,480 tons; French Indo-China, 3,000 tons; Malaya 71,940 tons; Netherland East Indies, 36,330 tons; Nigeria, 10,980 tons; Siam 18,000 tons. The International committee shall fix tonnages and a total of 11 favoring votes will carry any proposal. Stocks within any territory may not exceed 25 percent of standard tonnage. Any territory, in the event of war, may apply to the committee to temporarily exceed the permissible output.

QUICKSILVER Production

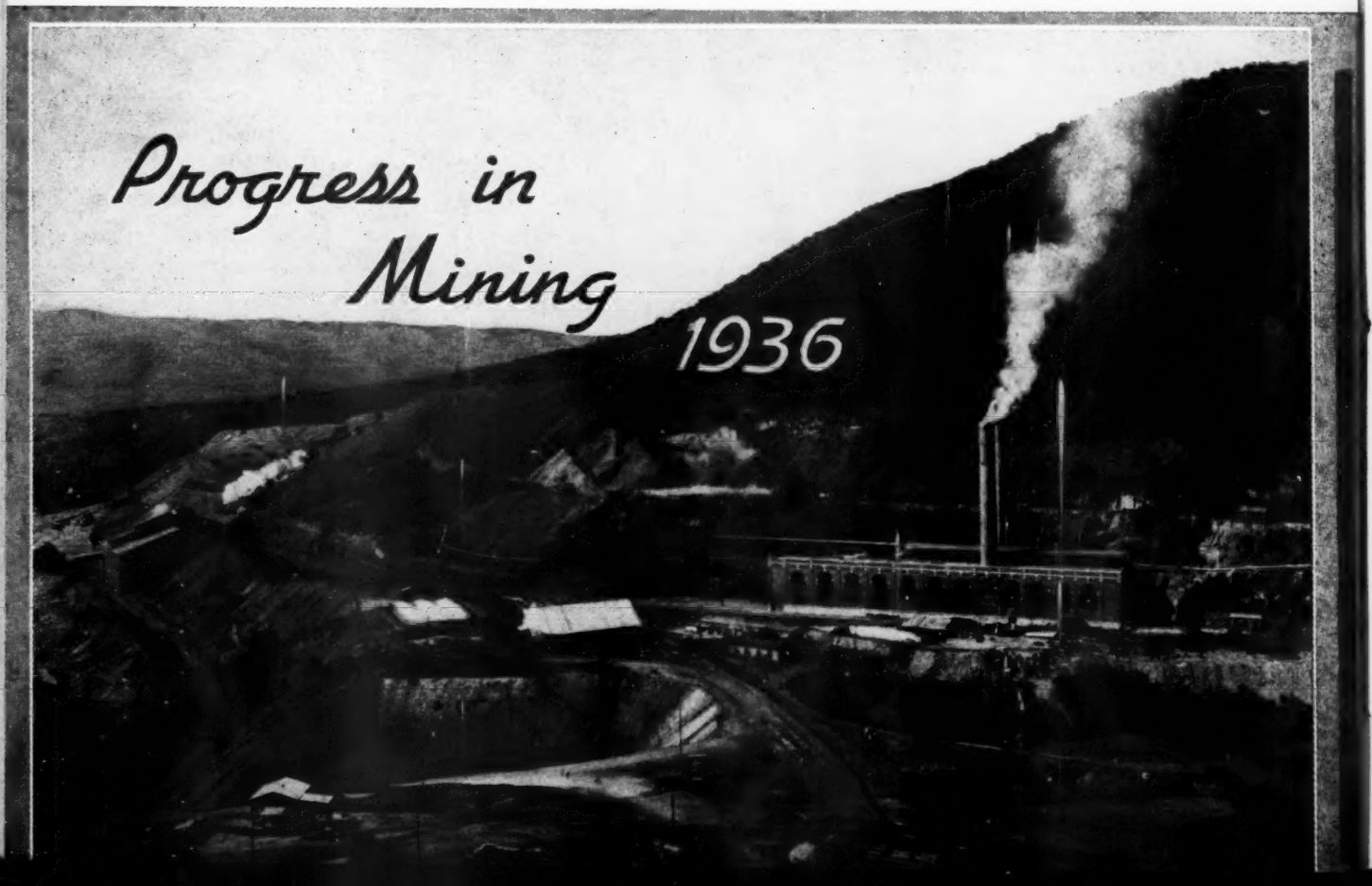
According to *Engineering and Mining Journal,* California Quicksilver production is estimated to have reached 1,000 flasks per month. J. R. Huttel in a recent article said, "The United States can furnish its own requirements of some 25,000 to 35,000 flasks per year at a price of $90 to $100 per flask . . . accurate and reliable cost data relative to mining and reduction of quicksilver ores in California are difficult to obtain except in respect to some of the large operators . . . total production in California is close to 1,000 flasks per month. Most properties are accessible over good roads and are in close proximity to large centers of population which assures adequate supply of materials at all times."

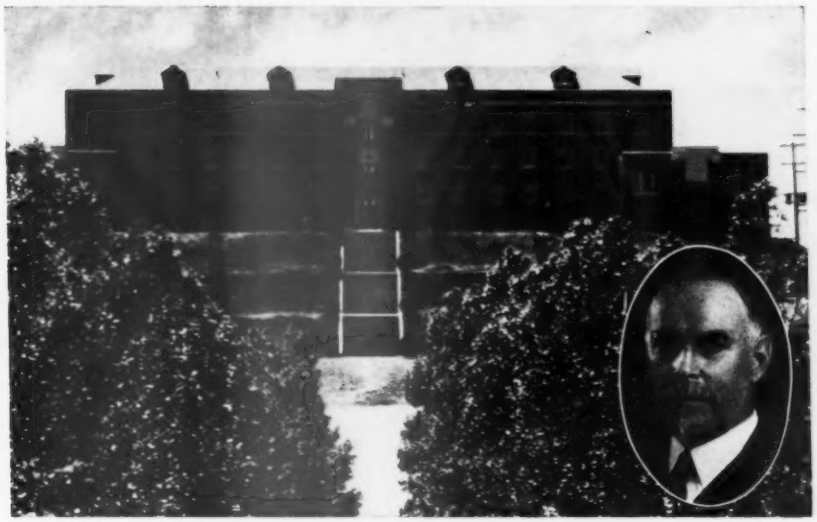
NICKEL Industry

Robert C. Stanley, president of the International Nickel Company recently released for publication his annual report on the industry for 1936. The report covers a large number of items particularly relating to the utilization of nickel. Mr. Stanley pointed out that statistics indicate that the current year will establish new records for the nickel industry in the volume and diversification of world consumption. This world consumption of nickel in all forms during the first ten months of 1936 attained a total of 162,000,000 pounds, an increase of more than 20 percent over the corresponding figures for 1935.

CANADIAN Mineral Production

Increases in output of many mineral products and increased prices for metals combined to make 1936 a better year for Canadian Mineral Production. According to the Mining Metallurgical and Chemical Branch of the Dominion Bureau of Statistics products from Canadian mines include, metals, fuels, nonmetals and structural material valued at more than $360,000,000 or an average of nearly $1,000,000 per day. Nineteen thirty-six production was 15.4 percent over 1935.





Montana School of Mines, Butte, Mont.
Insert—Francis A. Thomson, President.

Industry's Debt to the MINING SCHOOL

By FRANCIS A. THOMSON*

IN his interesting autobiography the late John Hays Hammond records that upon his return from three years of graduate study at the famous old Bergakademie, at Freiberg, he called upon the older Hearst, hoping to make a professional connection.

Expecting that family friendship, if nothing else, would procure me a position, I confidently asked Mr. Hearst for a job. To my amazement and chagrin he cheerfully declined even to consider me. When I regained control of my voice I inquired somewhat shakily why I was so firmly repulsed.

He replied frankly: "The fact of the matter is, Jack, you've been to Freiberg and have learned a lot of damn geological theories and big

* President, Montana School of Mines.

Above—Michigan College of Mines, Houghton, Mich.

Insert—Grover C. Dillman, President.

Right—School of Mines, University of Idaho, Moscow, Idaho.

Insert—A. W. Fahrenwald, Dean.

Right—Mechanical Hall, West Virginia University.
Insert—Charles E. Lawall, Director, School of Mines.

Below—South Dakota State School of Mines.
Insert—Joseph P. Connolly, President.

Below—Mineral Industries Building, Pennsylvania State College.
Insert—William R. Chedsey, Professor of Mining.

names for little rocks. That don't do in this country."

I asked whether he had any other objections.

"No," he answered, smiling. "Freiberg is enough."

"Well," I said, "I'll make a confession to you if you won't tell my father. I *didn't* learn anything of importance at Freiberg."

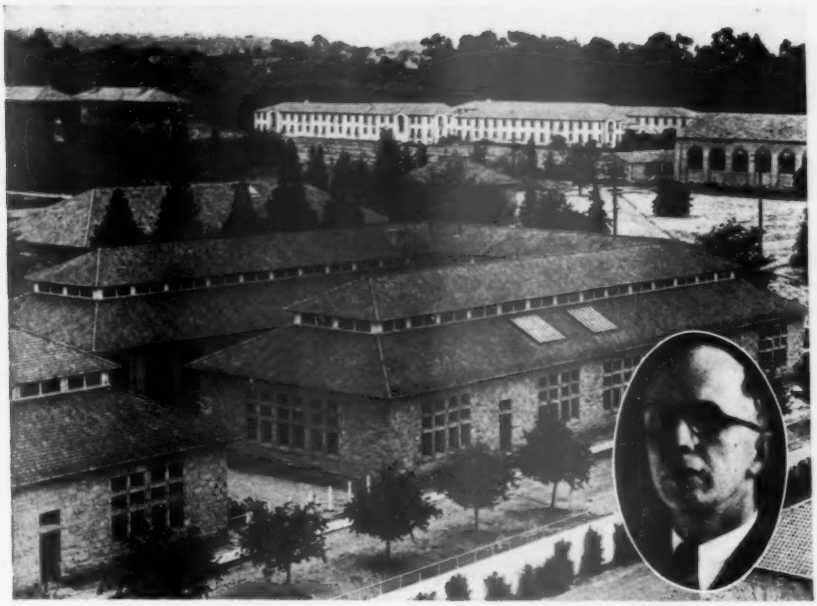
"What!" ejaculated Mr. Hearst. "In that case you might come around tomorrow and perhaps I can give you a job."

In this unorthodox fashion I secured a start in my profession.

Left—Hearst Memorial Mining Building, University of California.
Insert—Frank H. Probert, Dean, College of Mining.

Such was the situation in 1879. A few years ago a particularly well-known, self-educated and scholarly member of the mining profession in the northwest, for whom I have great admiration, said to me,

"In my day it has become increasingly difficult for me to compete professionally with younger men who have had a technical education. In the next generation it will be utterly impossible for men like myself to do so."



Left—Mining Building, Stanford University, Calif.

Insert—Frederick G. Tickell, Executive Head, Department of Mining Engineering.

Center—Transportation Building, University of Illinois, Urbana, Ill.

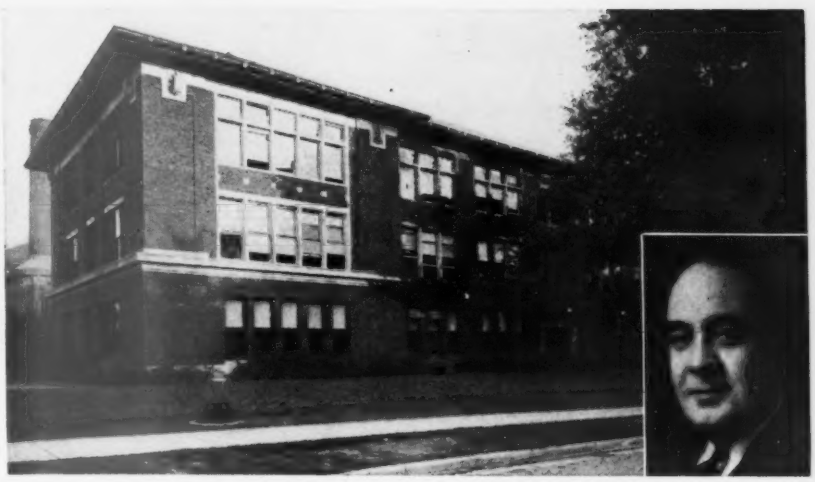
Insert—~~A. C. Callen~~, Head of Department of Mining and Metallurgical Engineering.

H. L. Walker - ~~Head~~ Dept

Lower left—School of Mines and Metallurgy, University of Minnesota, Minneapolis, Minn.

Insert—Elting H. Comstock, Head of Mining Department.

These two autobiographical incidents, dated fifty years apart, show exactly what has happened to public estimation of the mining school and of its graduates. Only indirectly, at first sight, do they point in any way to the title of this article, "The Industry's Debt to the Mining School," but closer examination establishes the connection. So far have we progressed in half a century that no captain of industry today would make any such remark as Hammond quotes from Hearst. Indeed the shoe is on the other foot entirely, for few, if indeed any, of the major mining enterprises of the country will engage a young man for a position even on the lowest rungs of the professional ladder unless he be a



technical graduate, with preference always for a graduate of one of the reputable mining schools. The reason must be perfectly obvious. It is this, that an able intelligent young man could, no doubt, be taught the routine of mapping, of assaying, of drafting, of core-checking, of well-logging, or any other task of a semi-professional nature in mining or mineral technology, but when the time came to promote him, he would in nine times out of ten be utterly unacquainted with the duties of the next job in the line or the staff, and his superiors do not have time to teach him everything.

Furthermore, with the universal application of geology to the finding and exploitation of mineral deposits, with the increasing complexity of mining operations, and with the constantly expanding application of scientific principles in mineral technology, uneducated men, however brilliant and able they may be, are

found inadequate to solve the problems which must be met every day. Indeed, professional training in the mineral industry is today recognized almost as universally as it is in the older professions of the ministry, of law, and of medicine.

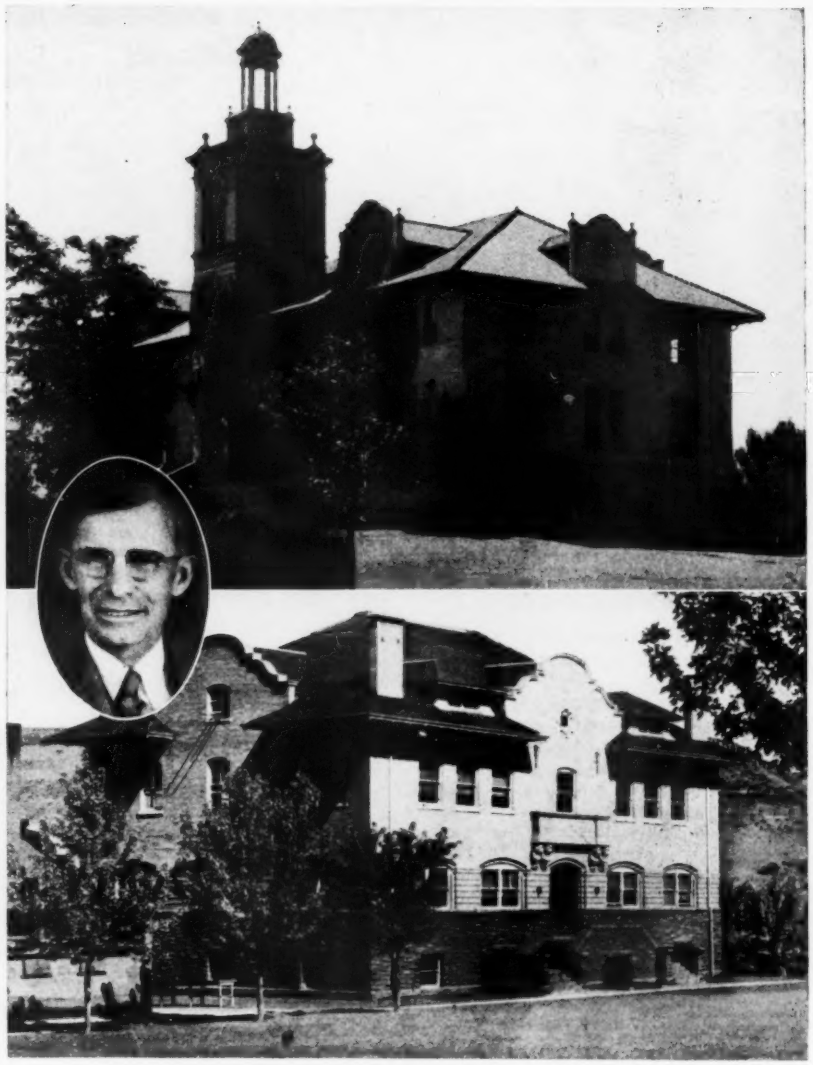
Now, it would be ridiculous to pretend that a mining school or any other college can, in the course of four or five years, teach a boy just out of high school all that he will need to know if he is to be a factor in the mineral industry, but sound technical training does do several things: In the first place it gives a young man a point of view which tends to make him "indefensible against the truth" and which leads him to insist upon ascertaining the facts before he reaches a conclusion. That a young man has persisted for four years of good hard study also means that he either had, or has developed capacity; capacity to learn and capacity to attend to business, and a diploma from a reputable technological college is almost a guarantee of sound character.

As the national secretary of one of the well-known college fraternities said in my hearing to a group of college boys some years ago,

> "Fellows, I've finally concluded that there is a definite correlation between scholarship and character."

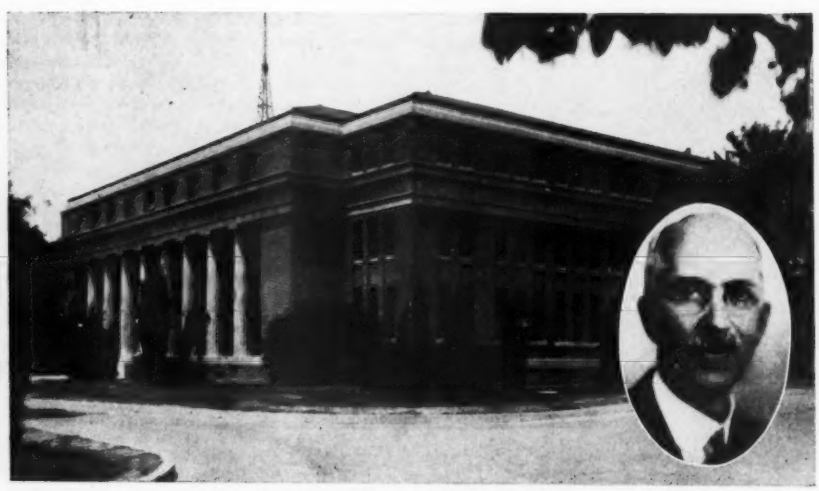
All of this then constitutes part of the debt which industry owes to the mining school. In other words, the mining school, by the inevitable and inexorable process of selection which goes on between matriculation and graduation, is segregating the personnel from which most of the successful mining executives of the present and the future have been or will be drawn. If anyone doubts the validity of the statement let him examine the September issue of the MINING CONGRESS JOURNAL. Let him go through the "portrait gallery" of outstanding western operators, let him make a list of these men and check their training, as I have done in the preparation of this article, and he will find—with here and

(*Continued on page* 36)



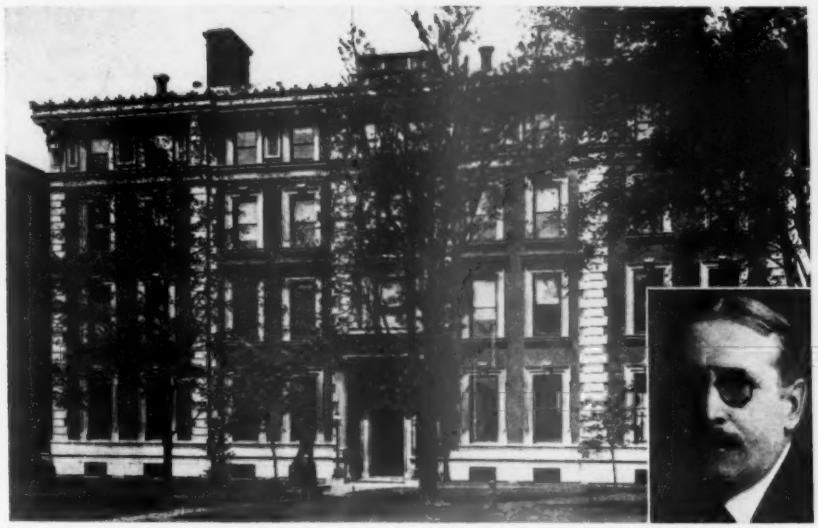
Above—Guggenheim Hall, Administration Building; below—Stratton Hall, Colorado School of Mines, Golden, Colo.

Insert—Melville Fuller Coolbaugh, President.



Left—College of Mines and Engineering, University of Arizona, Tucson, Ariz.

Insert—G. M. Butler, Dean and Director.

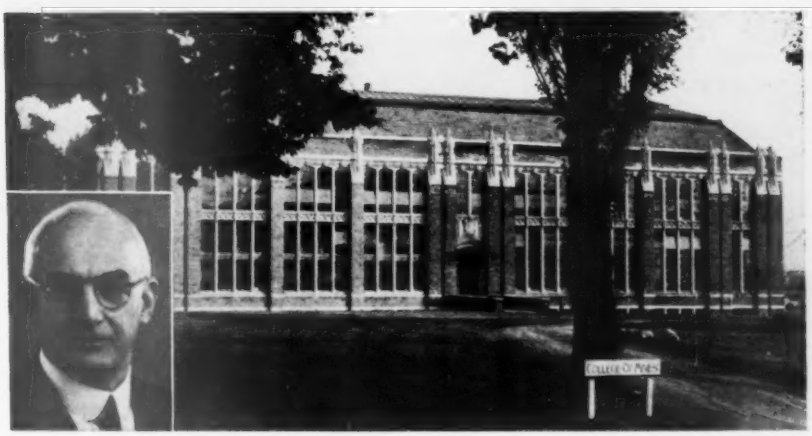


Left—School of Mines, Columbia University, New York City.

Insert—Prof. Thomas T. Reed.

Right—College of Mines, University of Washington, Seattle, Wash.

Insert—Milnor Roberts, Dean.



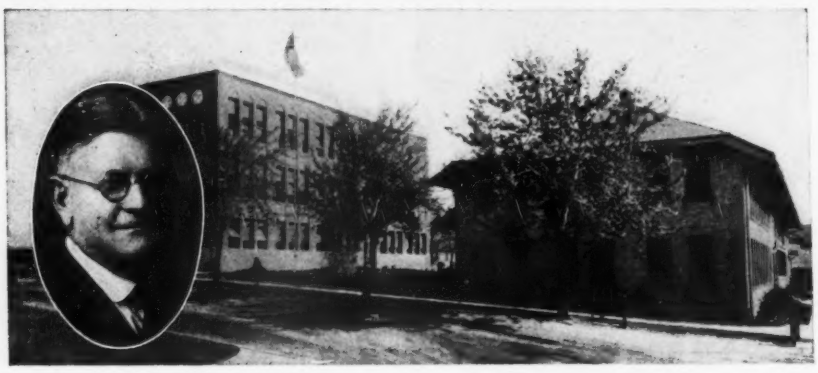
Left—Eckley B. Coxe Mining Laboratory, Lehigh University, Bethlehem, Pa.

Insert—Howard Eckfeldt, Professor of Mining Engineering.

A. C. Callen, Dean

Upper left—Brown Hall (Administration Building), New Mexico School of Mines, Socorro, N. Mex.

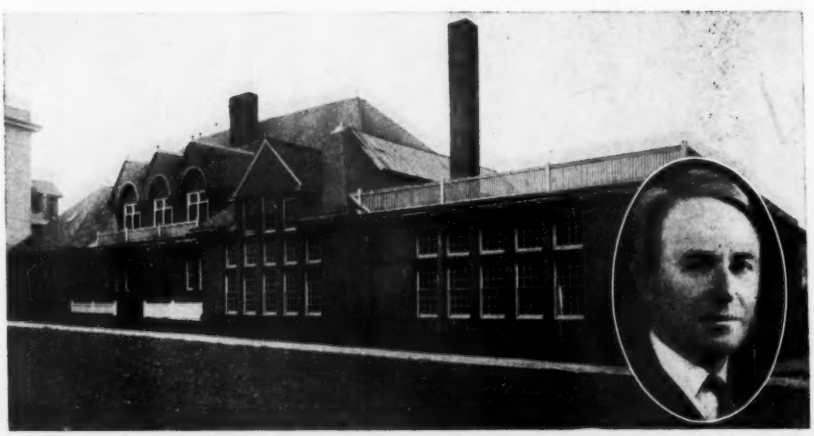
Insert—E. H. Wells, President and Director.



Lower left—School of Mines and Metallurgy, University of Utah, Salt Lake City, Utah.

Insert—Richard B. Ketchum, Dean.

Upper right—Rotch Building, Harvard University, Cambridge, Mass.
Insert—D. H. McLaughlin, Head of Mining Department.

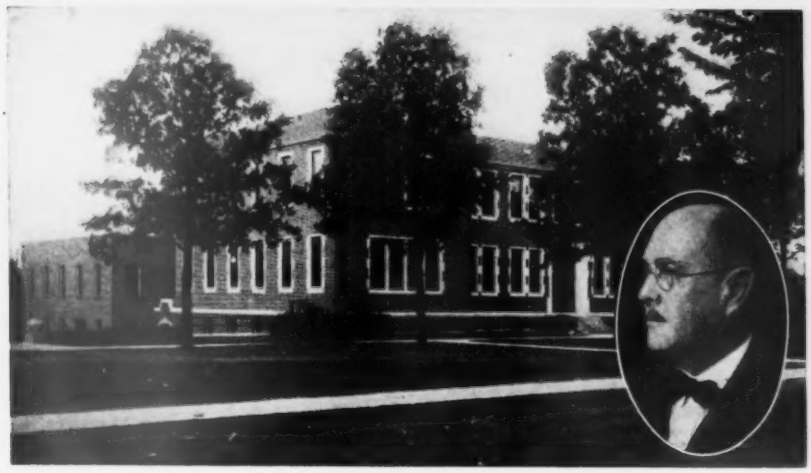


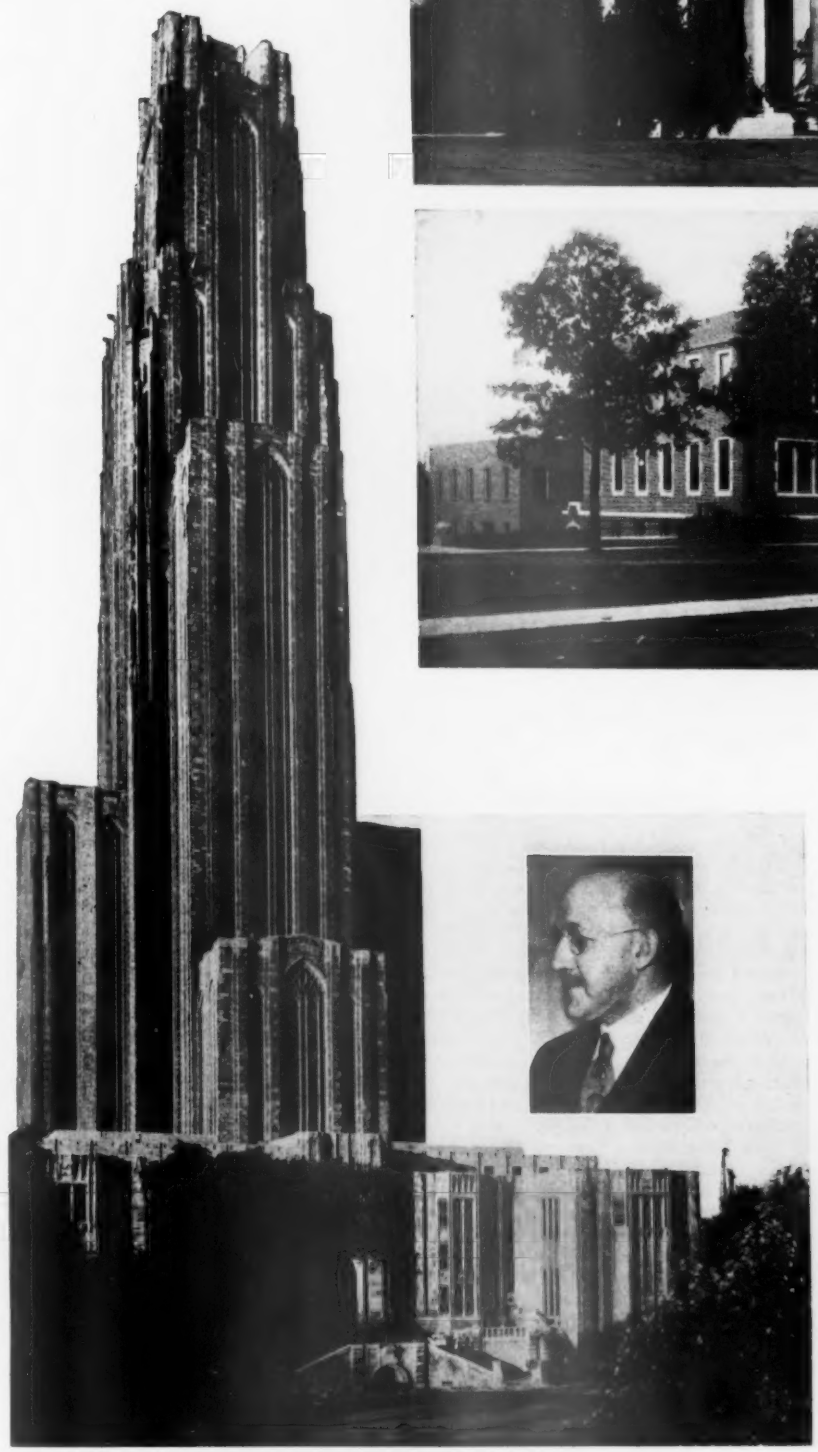
Lower right—Massachusetts Institute of Technology, Cambridge, Mass.
Insert—W. Spencer Hutchinson, Professor of Mining.

there a notable exception—hardly a significant man in the industry today who is not a college graduate, and he will find further that among the younger men of this list, almost all are mining school graduates. Exactly the same thing is revealed by examining the directory of the American Institute of Mining and Metallurgical Engineers, the greatest professional organization of the mineral industry. Men are elected to high office in this organization solely by reason of eminence in their field, and the roster of past and present officers shows

Right—Mackay School of Mines, University of Nevada, Reno, Nev.

Insert—J. A. Fulton, Director, School of Mines.





Center—School of Mines and Metallurgy, University of Missouri, Rolla, Mo.

Insert—Chas. H. Fulton, Director.

Curtis L. Wilson, Director

Left—Cathedral of Learning, University of Pittsburgh, Pittsburgh, Pa.

Insert—E. A. Holbrook, Dean of Schools of Engineering and Mines.

scarcely a name appears which is not that of a college graduate.

This, then, is the answer. The mining schools are selecting and educating the brains of the mineral industry.

The mining schools are making other contributions through research, through publication, and through professional leadership on the part of eminent men on their faculties, but above all and beyond all, industry is indebted to the mining schools for its brains and direction. Could any contribution be greater?

The Gold and Silver Questions†

By THE HONORABLE KEY PITTMAN*

I DEEPLY appreciate this invitation to discuss the subject of gold and silver legislation and administration before an audience that is so deeply interested in the subject. In the first place, let me congratulate you on having as your chairman, Mr. Stanly A. Easton, who is a practical miner, a student of monetary problems, and a recognized authority on the production, consumption and uses of gold and silver. This Congress is to be congratulated upon the large and representative attendance.

The gold legislation was forced upon the United States by the action of other governments. They first departed from the gold standard and depreciated their currencies with regard to gold. By these acts they automatically increased the value of gold with reference to their currencies. They discredited currencies by such acts, created monetary panics, brought about the great urge for the hording of gold.

The United States Government has fixed the price of gold at $35 an ounce. It will be remembered, of course, that the price of gold, until various countries went off the gold standard, was stabilized throughout the world at $20.67 an ounce. This price was originally established by Great Britain, when it declared that a pound sterling would purchase 113.0016 grains of gold and that that number of grains of gold would purchase a pound sterling.

It must be remembered that the value of the pound sterling was based upon a pound of silver, and a pound of silver was equal to 20 silver shillings. In other words, the Government of Great Britain stated that so many shillings would purchase so many grains of gold. In other words, it was the silver shilling that measured the value of gold, and also measured the value of the pound sterling, which was and is the unit of monetary value in Great Britain.

When our Government established its Coinage Act in 1792, it followed some statutory monetary system that had been adopted in Great Britain. It adopted as its unit of monetary value the dollar. The value of the dollar was measured, also, by silver; namely, 371¼ grains of silver. In other words, the unit of value of the dollar was almost one-fifth of the value of the pound sterling. So as to maintain substantially the same ratio between the value of gold and silver that had been established by Great Britain, the value of the dollar was also made equal to 24.75 grains of gold. The value of gold was subsequently increased with reference to the dollar, and also silver, by fixing the value of gold at 23.2 grains for the dollar.

It will be observed that there were 16 times as many grains of silver as there were grains of gold as a measure of the dollar. This ratio between the value of gold and silver was not an accident. There had been an effort by governments as far back as the beginning of the eighteenth century to attempt to establish the relative value of gold and silver based upon the average production of such metals. It varied for a long time between 14 and 15 grains of silver to one grain of gold. Great Britain early in the nineteenth century established the relative value of the two metals at approximately sixteen grains of silver to one grain of gold. That is where the expression of the coinage of silver at 16 to 1 arose. Our Government in the establishment of the dollar and the ratio between gold and silver followed the same formula and established such a ratio at substantially 16 to 1. Our monetary system was established on true bimetallism; that is, there was a joint measure of the dollar, both in gold and silver. In other words, as finally established, the dollar could be redeemed with 371¼ grains of silver or 23.2 grains of gold, and, on the other hand, our Government purchased through coinage 23.2 grains of gold for a dollar and 371¼ grains of silver for a dollar. I say this is true bimetallism, because there was a dual measure of the dollar unit, and our Government was at liberty to utilize either metal in the redemption of its currencies. This was considered wise at that time by reason of the fact that while the average production over a long period of time of the two metals was approximately 16 to 1, the relative production of such metals varied during certain shorter periods.

In 1873 there was an extraordinarily large production of silver in the world, caused by the opening up of new silver mines in the western part of the United States, and particularly the development of the great Comstock mines at Virginia City, Nevada. This unusual and enormous production in silver frightened economists in the United States who were unfamiliar with the average production of silver and gold over a period of 300 years, and conceived that the world was going to be flooded with silver and that it would become as cheap as iron. How foolish they were has been proven by the proportionate decrease in the production of silver as to gold from that period of time down to the present. The average production during such period has been less than 15 ounces of silver to one ounce of gold, yet in 1873 in the preparation of a new coinage act, silver was demonetized—I may say secretly demonetized—because few had knowledge of the provision or its effect. In this act it was declared that gold and gold alone should be the measure of value of the dollar, and at the same time the legal tender character of the silver dollar was destroyed. Of course, the result of this act was the depreciation in the value of silver. Had gold been demonetized instead of silver, the same depreciation in the value of gold would necessarily have occurred, because the chief value of either metal resides in its monetary value.

The falling price of silver and the strong reaction in all quarters against the demonetization of silver caused the enactment of certain laws for the purchase of silver for the coinage of silver dollars. Such an act was in force in 1893. At this period a monetary panic swept across the world, commencing in the early part of 1893. It originated in Great Britain and swept across the United States. The same deluded economists who brought about the demonetization of silver started propaganda to the effect that the panic was due in the United States to the purchase and coinage of silver dollars. And so, in 1893, the Silver Purchase Act was repealed. Silver in the world was thereafter used in a monetary capacity solely in the coinage and circulation of subsidiary silver coins; that is, dimes, halves and quarters, or

† Presented to Metal Mining Convention of the American Mining Congress at Denver, Colo., October 1, 1936.

* U. S. Senator from Nevada.

similar coins in other countries. While the value of silver depreciated, such coinage of subsidiary coins, by creating some demand for silver other than in the arts and sciences, tended to stabilize silver between 50 and 60 cents an ounce, at which values it remained until the beginning of the World War.

There then arose a large demand for silver to meet the needs of an enormously increased commerce, and to pay the wages of soldiers. This increased demand made it impossible for the British Government of India to redeem its paper silver rupee notes. They were willing to redeem these notes in gold but the people of India were accustomed to the use of silver and would not accept gold. A crisis had been reached in India. A revolution was threatened by reason of the apparent necessity of the British Government in India to declare the incontrovertibility of the paper rupee notes; in other words, that such notes could not be redeemed into silver. This was 1918, when the result of the European War was held in the balance. It was absolutely necessary that the British Government for India should obtain silver. They required at least two hundred million ounces of silver. They could not find any such supply in the world, except the supply of silver dollars lying in the Treasury of the United States and held there for the redemption of silver certificates issued against such dollars.

Our Government, under the Pittman Act, authorized the melting up or otherwise changing into bullion of 250 millions of standard silver dollars to meet the demand of India for silver. The demand was met, and a revolution in India was prevented. Except for this act, it is possible that the whole current of the war might have been changed. It is possible that the Allies might have been defeated. This large supply of silver in the Treasury of the United States proved beyond doubt the value of a large reserve of silver.

And so the increased demand for silver, although such demand was partially artificially met by taking silver coins out of reserve, caused silver to rise in price to around its monetary value of $1.29 an ounce.

After the end of the War, and in 1919, silver rose to the price of $1.38 plus per ounce throughout the world. This was above the monetary value of silver in all countries. Silver coins commenced to be melted up and sold as bullion in every country in the world, including the United States, because the value of the silver in the coin was worth more as bullion than it was as money.

The United States Government stopped the melting up of silver coins in the United States by breaking down the price of silver throughout the world. It accomplished this by making available to the exporters of silver fifty millions of our standard silver dollars to be dumped upon the market of the world as bullion. It accomplished the purpose intended; in fact, it went farther than was intended. The price of silver dropped from $1.38 an ounce to below $1 an ounce.

It was a carelessly and cruelly administered program on the part of the Treasury Department. It was the duty of the Treasury Department to bring the price of silver below the monetary value of our silver coins, but it was a breach of confidence to place in the hands of brokers and speculators the power to almost destroy the exchange value of silver money.

Great Britain, France, Belgium, and other countries availed themselves of this excuse and debased their silver coins. That is, they took part of the silver out of the coins and substituted base alloys. The surplus silver derived from this source they also ruthlessly and without limitations dumped upon the market of the world. And, mind you, this was done even after the Acts of the United States had already accomplished the purpose which these other governments pretended they intended to accomplish by such debasement.

And then in 1926 the Government for India passed a law authorizing the melting up, without limit, of silver coins in the Treasury of India and the dumping

Senator Key Pittman

of such silver upon the market of the world without regard to demand and without regard to price. And so silver fell in price to as low as 24½ cents an ounce!

The impression rapidly gained that silver was worthless. Our Government did nothing to remedy this evil condition, and yet, at the time that these sales were proceeding from India in 1928 our Government had in circulation in the United States 539,961,701 silver dollars, or silver certificates secured by silver dollars, which they guaranteed to maintain at a parity value with gold and a value of $1.29 an ounce of silver. And at that time, in 1928, our Government had in circulation in subsidiary coins—that is, dimes, halves, and quarters—of the value of $299,010,231, which they guaranteed to maintain at a parity value with gold of $1.38 an ounce. Is it not evident that such destruction of silver was placing a tremendous burden upon gold and upon the Treasury of the United States?

And then commenced an effort on the part of some of our Congressmen to remedy this condition. Free coinage of silver bills were introduced. They were defeated by majorities that proved that no such acts could become law at that time. Silver purchase acts were introduced requiring the Government to purchase at least fifty millions of ounces of silver per month. These acts were also defeated by such majorities that it appeared evident that no such acts could be passed.

In 1933 an economic and monetary conference was held at London. There were 66 governments represented at that conference, including the United States. The President thoroughly realized that the destruction of the monetary value of silver must be stopped, and to that end that unnatural and prejudicial acts of governments should cease. With the President's approval, on behalf of the delegation of the United States, I presented at the conference a resolution which was unanimously adopted. It provided that the Government for India, after the first of January, 1934, should not sell silver from the melting up of its coins to exceed 35 million ounces annually for a period of four years. It was understood that after such sales India would have disposed of its so-called redundant silver and would discontinue further sales from melted coins; that governments would refrain from debasing their silver coins below .750 fine; and that in the future, so far as possible, their coins would have at least such fineness; that low valued paper currency would be withdrawn and silver coins substituted in lieu thereof, so rapidly as practicable; that the silver-producing countries would absorb into their treasuries an amount of current production of silver equal to the amount of silver sold by the Government for India, and also the Government of Spain, which was limited to five million ounces a year for four years.

The Government of the United States, to carry out this agreement, found it necessary to purchase current production of silver in the United States. It was also necessary to raise the price paid for American silver above the world price, to prevent the silver leaving this country.

The rise in the world price of silver caused the President to raise the price of domestic silver to 77.56 cents an ounce. The world price of silver afterwards dropped to around 45 cents an ounce. The President, however, refused to reduce the price of American-produced silver. He was fully justified in such refusal. This rise in the price of American silver caused the opening up of many mines in the United States—gold, silver, lead, copper, and zinc mines.

(*Concluded on page* 61)

The Nation Inaugurates a President of the United States.

Pictures, Inc.

Wheels of Government

As viewed by A. W. Dickinson of the American Mining Congress.

JANUARY in Washington—the convening of Congress, the Presidential Inauguration, much talk of the labor situation, sit-down strikes and coming Federal Labor Bills—

On January 5 the opening of the 75th Congress brought a Presidential Message which was given an enthusiastic reception by the members. The message asked for quick action to extend the Reconstruction Finance Corporation, the Presidential powers over the stabilization fund and the value of the dollar and the Foreign Trade Agreements Act. Other subjects touched upon were housing improvements, amendment of the Social Security Law and some form of legislation to accomplish the objectives sought under the National Recovery Act. The President's statement that separate agencies should be created to regulate business practices and working conditions corresponds rather closely with the proposals advanced by Donald Richberg in his recent addresses. It is a significant fact that Mr. Richberg is a frequent White House caller, and it is also worth noting that there has been no indication of administration approval of certain regulatory measures introduced in the Seventy-fifth Congress, such as for example, the O'Mahoney Corporation Licensing Bill.

Hearings on the O'Mahoney Bill began on January 25 before a subcommittee of the Committee on the Judiciary composed of Senator O'Mahoney (Dem., Wyo.), chairman; King (Dem., Utah), Logan (Dem., Ky.), McCarran (Dem., Nev.), Van Nuys (Dem., Ind.), Hatch (Dem., N. Mex.), Norris (Ind., Nebr.), and Austin (Rep., Vt.).

In the course of the hearings Senator O'Mahoney first explained his bill. He was followed by John T. Flynn, economist; Professor Walton Hamilton, of Yale University; Dr. Charles A. Beard, historian and writer; William Green, president of American Federation of Labor; and Charlton Ogburn, counsel, American Federation of Labor.

Up to the present time there have been no appearances made by opponents of the measure and it is known that very few have indicated their intention to appear. The general view expressed by commentators is that the O'Mahoney Bill will not become law, but that the real action on measures to regulate business and working conditions will develop at a later date.

As to taxation the President in his message did not propose any new taxes but he did oppose any reduction in revenue at this time. The Budget Message calls for expenditures of $6,157,999,254. The anticipated revenues are placed at $7,293,607,197. The President stated that the difference between these two figures, amounting to $1,135,607,943, would be

available for recovery and relief and statutory debt requirements. Inasmuch as $910,000,000 was asked for deficiencies and relief for the present fiscal year it appears certain that there will be further additions to the public debt, now standing at over $35,000,000,000. The President warned the Congress that if new legislation imposed increased expenditures over budget estimates, revenues therefore would have to be developed through additional taxes.

Among the regulatory bills reappearing is the new Bituminous Coal Act of 1937 by Senator Guffey (Dem., Pa.) and Representative Vinson (Dem., Ky.). These bills are now lying in the Interstate Commerce Committee of the Senate and the Ways and Means Committee of the House. No action as to hearings has been taken. Up to the present time, however, among the coal producers from the Mississippi River on East, there has been decided activity in an effort to develop an agreed bill through amendments to or a rewriting of the Guffey-Vinson Bill. In the month of December meetings were held in New York by the two factions of coal producers who in 1935 and 1936 were known as Pro-Guffey and Anti-Guffey. It now appears that these two factions have joined and have been working continuously and are still working to develop a measure which will, in the main, keep the control of the affairs of the industry in the hands of district marketing agencies, with a minimum of participation on the part of the Federal Government. The significant features of the most recent draft are the elimination of the excise tax on coal produced, also elimination of coal codes, district boards, minimum price areas and the consumers counsel. The draft further contemplates that the district marketing associations will fix minimum prices for members and that minimum prices for non-members shall be established by the National Bituminous Coal Commission.

Future action on Federal coal legislation is intimately related to the present situation in the coal, steel and automobile industries. The wage agreements in the bituminous and also in the anthracite industries expire as of April 1, 1937, and the public press carries stories of unrest and threatened unrest in the other industries. Just what the strategy in connection with these labor controversies will develop only the future can tell.

In line with the fact that the President has as yet given no indication of any additional taxation or increase in taxation, there is only unofficial mention of a Revenue Bill. The "nuisance" and excise taxes which are due to expire this year will undoubtedly be reenacted.

Senator King, of Utah, has introduced bills which call for an easement under the tax on undistributed earnings of the situation of corporations in the retirement of their debts. His bill also provides for a dividend-paid credit to cover expenditures for plant and equipment and for the development of mines. These are sorely needed amendments which were called to the attention of the committees of Congress when the Revenue Bill of 1936 was in the course of enactment.

Senator Adams (Dem., Colo.), made a determined effort to so amend the Revenue Act when it was under consideration on the floor of the Senate last June, but in the rush for enactment and due to the fear on the part of Treasury Representatives that such exceptions would materially affect the flow of revenue from the tax, his amendment was not included.

Both the Reconstruction Finance Corporation and the Interstate Commerce Commission have pointedly criticized the tax on undistributed earnings. The interest of the Reconstruction Finance Corporation in the repayment of federal loans can readily be understood and if the money for these repayments is to be subject to a tax of 27 percent in excess of the normal corporation tax of approximately 15 percent, a very serious question as to the continuance of the loans immediately enters the picture.

In the case of the Interstate Commerce Commission, the criticism of the tax on undistributed earnings was made in its annual report. The report declared that the tax prevents the sound financial management of railroads and is directly opposed to the creation of sinking funds for the retirement of obligations prior to maturity and the refinancing of additions and betterments in railroad property out of earnings. The Commission recently permitted the Greyhound Bus Corporation to issue preferred securities as a dividend payment in order that the corporation might avoid a heavy undistributed earnings tax, which it would otherwise have had to pay from earnings. There is no question that when the thousands of small corporations come to a realization through the preparation of their income tax returns, of what this tax means, there will be a storm of protest lodged with their congressional delegations in Washington, and it is earnestly to be hoped that consideration will be given to the distressed condition of these enterprises which are the real source through which employment and payrolls are now being and could further be increased.

In connection with the Social Security Tax on employes' wages and on payrolls, the Bureau of Internal Revenue has recently ruled that the taxes are to be levied upon the gross earnings of contract miners, regardless of the deductions which should properly be made for the expenditures for explosives consumed in the course of the business. In a great many anthracite, bituminous coal and metal mines it is the usual practice to pay contract miners at a fixed rate per ton or per foot. This payment in many cases has always contemplated the furnishing of explosives and certain other minor consumable goods and services by the miner. In determining the miner's "wages" paid for labor only, the cost of the explosives and the minor consumable goods and services has always been deducted from the miners' gross earnings. The ruling made by the Bureau in this case will be the subject of a further presentation by representatives of the mining industries in an effort to correct the situation without resort to litigation, as it seems inevitable that a Court would not countenance the inclusion of explosives in the gross earnings of contract miners upon which the Social Security Tax is to be paid.

Stream Pollution Legislation is in the picture again this year. Senator Lonergan (Dem., Conn.), has again introduced his bills of last year. It will be remembered that these bills were the subject of extensive hearing in which the mining industries stated their position at length. In addition to the Lonergan Bills, the Barkley (Dem., Ky.) and Vinson (Dem., Ky.) Bills are again introduced. It is too early in the session for procedure to be indicated, but it is quite possible that a move will be made to report these bills without hearings. The Lonergan Bills provide for a wide measure of federal control. The Barkley-Vinson provide for surveys and studies, and aid to states and municipalities, with a particular view to the public necessities and the public interests involved.

National Labor Relations Act

That the constitutionality of the Wagner-Connery National Labor Relations Act will be ruled upon by the Supreme Court this spring became a virtual certainty in view of the Court's announcement that arguments on the seven cases involving the Act would be heard the week of February 8.

In two of the cases now before the Court the appellate Court held the Act valid. These were in the Greyhound Bus and Associated Press cases where the question of the interstate nature of the business was apparently the deciding factor. In the other five cases, involving three companies, the lower court held the Act invalid. In all, 18 cases involving 18 different firms have been decided by Circuit Courts of Appeals. Practically every attempt to have the Act apply to industries engaged in the manufacture and production of commodities has met with failure in the Circuit Courts. The latest decision came a week ago in San Francisco when the Act was again held invalid in the Mackay Radio case. It is significant that the cases pending before the Supreme Court call not only for a decision on whether the Act as administered is beyond the commerce power of the Congress, but also whether it violates the Fifth and Seventh Amendments, and whether the Act's enforcement may be enjoined.—*A. M. C. Bulletin Service.*

Of All Things . . .

JANUARY

. . . The President tells the 74th Congress that big business is throttling the Nation and the Congress replies by throttling business with 10,000 bills. . . . A year later it becomes known that the Nation's tax revenues will reach a new all time peak of $7,000,000,000 . . . paid mostly by big business. . . .

. . . The annual budget, asking for $6,750,000,000, is submitted. . . . Seven months later the taxpayer finds it's going to cost more than $8,000,000,000 to run his Government, proving that Government budgets get so big they just can't be budged. . . .

. . . The Supreme Court invalidates the AAA and orders repayment of impounded processing taxes. . . . A year later the taxpayers are still waiting for court decisions to get their money. . . .

FEBRUARY

. . . Swiss-American trade agreement is signed. . . . Half dozen American watch factories promptly add to unemployment total. . . .

. . . House of Representatives, shaking in its collective boots, votes investigation of Townsend Old Age movement. . . . When election results are in, every member proudly boasts that they knew all the time the "Townsendites didn't amount to much." . . .

MARCH

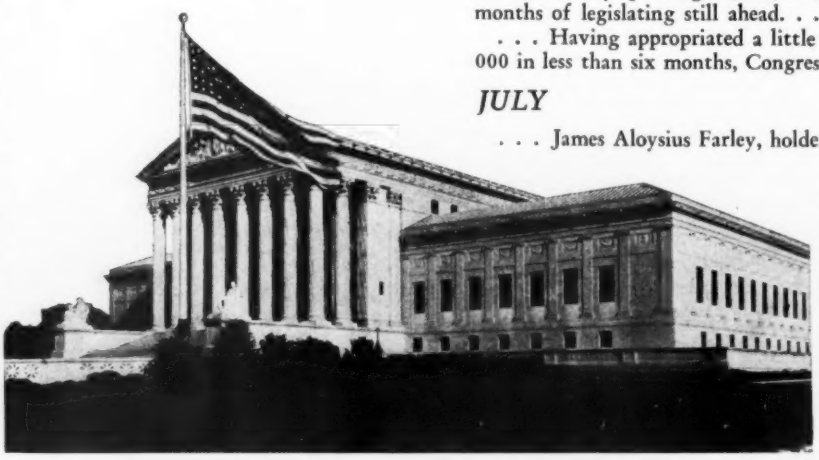
. . . Administration spokesmen proudly announce depression is licked and unemployment on wane. . . . Ten months later new unemployment figures disclose 6,000,000 out of work and Congress is told by Relief Chief Hopkins it might as well figure on a permanent relief load of four to five million. . . .

. . . Country, lulled for three months with assurances that no new taxes are necessary, gets shock when President's new tax program is dumped on them. . . . Following January, Congress also gets shock when it finds hundreds of small businesses can't run and pay taxes too, so stop running. . . .

APRIL

. . . House passes new corporation earnings tax bill, spokesmen explaining it was born from a marriage of necessity and opportunity. . . .

. . . Congress puts foot down and refuses funds for Quoddy and Florida ship canal. . . . Country so astounded at Congress that there is an immediate cry for an investigation. . . . 75th Congress proves need for investigation groundless. . . .



MAY

. . . Congress, contrite over refusing funds month before, turns around and gives President biggest fund ever—$1,425,000,000—to use as he desires for relief. . . . In November the adage that nobody shoots Santa Claus is again proved true. . . .

. . . WPA reports that it costs the taxpayer $80 per person to pay those on relief $33 a month. . . . Six months later statisticians are still trying to figure out where the other $47 per person is spent but overlook 20,000 people who make up WPA personnel. . . .

. . . Supreme Court says the Guffey Coal Act is unconstitutional. . . . Decision doesn't surprise the President. . . .

. . . Congress gets mad at Supreme Court, passes price discrimination law, tries to push through Guffey Act again. . . . For first time since Huey Long's death Nation realizes that a filibuster has its good points. . . .

. . . J. Edgar Hoover, chief of the G-men, in a speech, characterizes politics as "Public Enemy No. 1." . . . At last reports he hadn't changed his mind. . . .

. . . John L. Lewis buys a new Cadillac automobile. . . . The irony of that action came home to him some months later when the motor strike delayed getting parts for the car. . . . Even the strike promoter must expect to suffer inconvenience along with the rest of the poor public. . . .

JUNE

. . . Nation's debt reaches new all time high peak of $34,000,000,000. People go to make pilgrimage to grave of Speaker "Czar" Reed . . . man who once silenced a Congressman objecting to a million dollar expenditure by exclaiming that "this is a billion dollar country." . . . Signs disclose Reed has turned over in his grave recently. . . .

. . . Congress, competing with national political conventions for newspaper space, gives it up as hopeless task, sputters out. . . . Nation shudders as political barrage, confined for months within walls of Capitol, spreads throughout country. . . . Tremendous drought sweeps country . . . scientists blame hot air. . . .

. . . People give a sigh of relief as the Congress ends, and then brighten up with the assurance that it will be the last of the big spending Congresses. . . . Six months later they begin to get wise that the new Congress is making an excellent start by spending $2,000,000,000 in two bills with five months of legislating still ahead. . . .

. . . Having appropriated a little more than $20,000,000,000 in less than six months, Congress makes plans to adjourn.

JULY

. . . James Aloysius Farley, holder of several jobs, gives up Postmaster Generalship to direct political campaign. . . . Numerous career officials at Post Office Department are surprised to learn that Farley had been Postmaster General. . . .

. . . William Lemke, a candidate for President, announces if elected he will limit all

incomes to half million dollars annually. . . . Learns in November that half dozen people in the country thought he was promising a half million minimum income and voted for him. . . .

. . . Democrats jubilantly proclaim United States once again flowing with milk and honey like it did in Coolidge's time. . . . Pennsylvania Legislature wonders where all the milk and honey is when hunger marchers take possession of their Capitol. . . .

AUGUST

. . . Nation's Capital swelters in summer heat. . . . Rest of the country swelters under burning blasts of political oratory. . . .

. . . Logicians reason that because President didn't tell radio listeners he was running for President, his five speeches are non-political. . . . President thus retains his amateur standing. . . .

. . . The political campaigns get under way and everybody promptly tells everybody else that it will bring good times because of the money to be spent. . . . Some time later everybody learns that the Republicans spent $8,000,000 and the Democrats $5,000,000 but only the Lord knows how much it cost the taxpayer. . . .

SEPTEMBER

. . . President boldly admits he has turned professional . . . starts making political speeches. . . . Everybody is still trying to figure distinguishing difference. . . .

. . . Deficit of $2,000,000,000 more or less for fiscal year is predicted by President. . . . Some months later friends shyly admit Harvard does not insist that its students go in for mathematics. . . .

. . . Maine goes Republican. . . . People begin again saying . . . "as Maine goes, so goes the Nation." . . . Which proves that the New Deal doesn't stop at changing a law . . . it will even change a defenseless proverb. . . .

OCTOBER

. . . President tells country this is first year in 55 that there hasn't been a bank failure . . . also promises a balanced budget but neglected to mention date of balance. . . . Three months later he finishes the sentence indicating the balance is still a couple years away. . . .

NOVEMBER

. . . Three hundred thousand New Deal officials, worrying for six months, throw biggest party in four years . . . hitch up belts for another four-year stretch. . . .

. . . President, anxious to get away from it all, departs on long sea voyage to South America. . . . A lot of people can't understand why such a generous Administration doesn't call out the Navy and take us all along on the trip. . . .

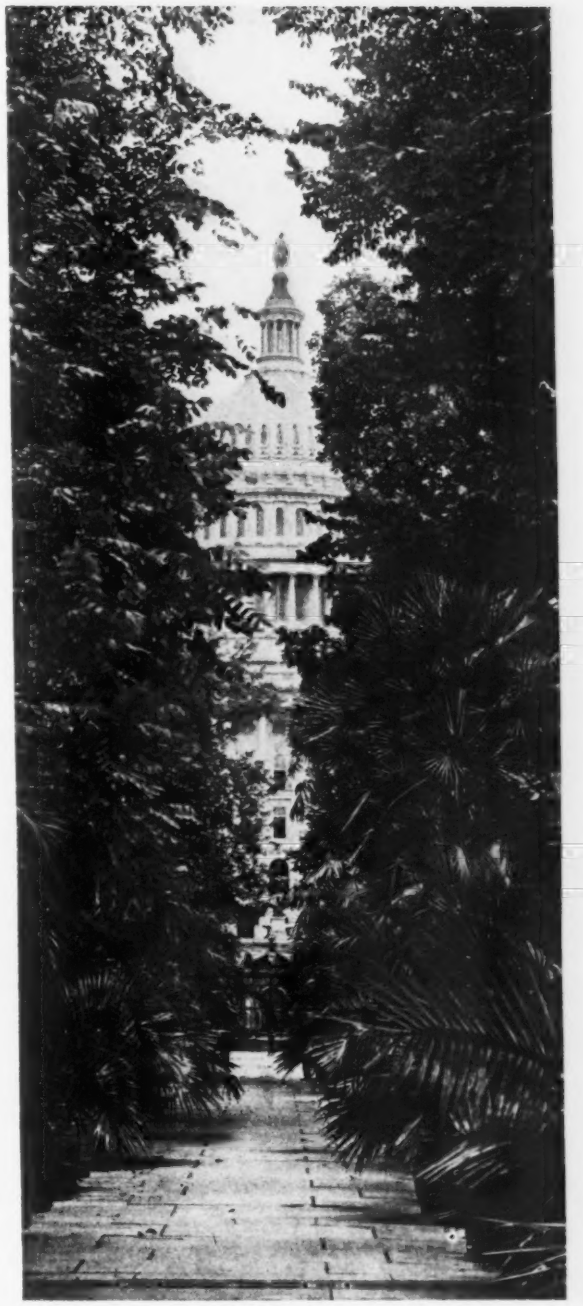
. . . Twenty-six million people are registered under the Social Security program . . . nobody has to worry any more after they pass 65. . . . First man under the plan to retire got lump sum settlement of 28 cents. . . .

DECEMBER

. . . With election out of the way, Treasury Department blithely tells the taxpayer his annual double tax bill alone to states and Federal Government is $2,250,000,000. . . . After that no one wonders why sales of headache tablets are so large in this country. . . .

. . . Review of first Roosevelt term shows that $2 was spent for each $1 taken in. . . . Most New Dealers very downhearted . . . promise to do better next four years . . . aim at $4 expenditure for every $1 income. . . .

. . . The public debt climbed just a little short of $21,000,000,000 in just a little short of four years . . . it will be just over $35,000,000,000 at the end of the fiscal year. . . About 100 years from now they're going to wonder what we did with the money. . . .



. . . The new budget calling for $6,000,000,000 in annual expenditures is prepared. . . . But the country is quickly reassured. . . . That $6,000,000,000 is a whole billion less than the estimated annual income. . . . Only the taxpayers have any kick coming. . . .

. . . The country gets ready for a new Congress. . . . It doesn't disappoint anybody . . . proves it's in fine fettle by introducing 3,000 bills the first day . . . and everybody knows that things are back to normal again. . . .

Thomas A. Edison

Edison Pioneered Low-Grade Ore Concentration

By GEORGE E. STRINGFELLOW*

ALTHOUGH not widely known, the late Thomas A. Edison was deeply interested in mining. More than fifty separate patents pertaining to mining, quarrying and allied operations were issued to him. Yet not a one of them ever showed him a commercial profit except in so far as he was able to adapt them to processes employed in other industries.

As early as 1879, the Edison Ore Milling Company was organized with a capitalization of $350,000. Extensive experiments were conducted in the development of the magnetic ore separator. The first magnetic ore separator was built at Menlo Park, N. J., in 1880, and during the year that followed several others were placed in operation along the Atlantic Coast, where several hundred thousand tons of relatively rich magnetic sand could then be found.

A Revolutionary Idea in Ore Milling

The pressing need for devising a method of concentrating low-grade ore for the requirements of eastern furnace men greatly encouraged Mr. Edison. He invented a device known as a magnetic needle which accurately indicated not only the presence of magnetic ore but also the quality and extent of the deposit. He conducted a great magnetic survey of the east. He had a number of men explore a strip reaching from lower Canada to North Carolina, using his special magnetic needle. When he had finished, he knew the width, the length and the approximate depth of every deposit of magnetic ore in the entire region covered.

Edison announced, "The amount of ore disclosed by this survey was simply fabulous. How much so may be judged from the fact that in the 3,000 acres immediately surrounding the mills that I afterward established at Edison there were over 200,000,000 tons of low-grade ore. I also secured 16,000 acres in which the deposit was proportionately as large. These acres alone contained sufficient ore to supply the whole United States iron trade, including exports, for 70 years."

It will be recalled that 1879 marked the invention of the incandescent lamp and that this was followed, in 1882, by the opening of the Pearl Street power house which was the beginning of the commercial generation and distribution of electricity.

The 1880's were strenuous years for Mr. Edison, for it was then, with the commercial electric power industry established, that he devoted himself to extending and improving it. How strenuous these years were may be judged by the fact that from 1880 to 1887 he took out upwards of 300 patents.

At any rate, as this decade drew to a close, it was possible to foresee that the commercial generation and distribution of electricity was destined to become a giant basic industry which along with the new industries which were to spring up as a result of it, would comprise a vast new market for our basic commodities, including, of course, iron and steel.

Doubtless anticipation of this industrial growth was one of the reasons which prompted Mr. Edison, in 1890, to select a site for the commercial production of low-grade ore near Ogdensburg, N. J., at a point now known as Edison.

There he devised what at that time was regarded as a large-scale crushing plant and among other things accomplished a saving of nearly 75 percent in friction losses compared to mills then commonly in use. With the rock reduced to a finely divided state, the ferrous ore was magnetically separated out.

In order to prepare the ore in a form suited for use in the reduction furnaces, Edison added to his crushing and separating technique, a final process of briquetting.

At West Orange, in New Jersey, is the ivy-covered laboratory of the late Thomas A. Edison, creator of markets. This historical building is surrounded by the acres of modern factories utilized by the Thomas A. Edison Industries in carrying on the work of their founder.

* Vice President and Division Manager, Thomas A. Edison, Incorporated.

+ + +

The late electrical wizard's interest in low-grade ore concentration yielded a technique which discovery of high-grade deposits rendered virtually useless in 1900 but which may in the future prove to be an invaluable contribution to mining.

+ + +

These ore briquettes made from Edison's concentrate were prepared with a special binder and moulded under pressures of 7,800, 14,000 and 60,000 pounds. When finished they were hard enough to withstand rough handling which was a requirement because of the problem of transporting them to the furnaces. The briquettes were porous enough to absorb 26 percent of their weight in alcohol, yet they shed water like the proverbial duck's back. They contained 91 to 93 percent iron oxide derived from low-grade ore averaging about 25 percent.

Iron Ore Research to a Conclusion

Edison derived not one penny of profit from this venture because when he had completed his patient step-by-step solution of the tremendous problem, the discovery of great deposits of rich Bessemer ore in the Mesaba range of mountains of Minnesota postponed the necessity for the beneficiation of the low-grade magnetic ore which he had undertaken.

But in 1910 when Edison went again to visit the site of his ore concentrating plant, he remarked, "I never felt better in my life than during the five years I worked here. Hard work, nothing to divert my thoughts, clear air and simple food made my life very pleasant. We learned a great deal. It will be of benefit to someone some time." Perhaps shortly in the future it will be found that Edison was again right.

Technical Opinion

The technical press of the period was jubilant over the results of Edison's work. In The Iron Age of October 28, 1897, a complete review was published, the trend of which is indicated by the following excerpts:

"There is very little that is showy, from the popular point of view, in the gigantic work which Mr. Edison has done during these years, but to those who are capable of grasping the difficulties encountered, Mr. Edison appears in the new light of a brilliant constructing engineer grappling with technical and commercial problems of the highest order. His genius as an inventor is revealed in many details of the great concentrating plant. . . . But to our mind, originality of the highest type as a constructor and designer appears in the bold way in which he sweeps aside accepted practice in this particular field and attains results not hitherto approached. He pursues methods in ore-dressing at which those who are trained in the usual practice may well stand aghast. But considering the special features of the problems to be solved, his methods will be accepted as those economically wise and expedient."

Thomas Alva Edison was born at Milan, Ohio, February 11, 1847. This year marks the ninetieth anniversary of his birth.

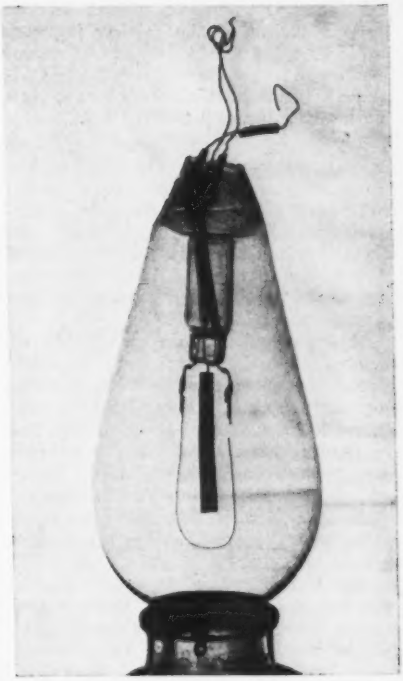
As a child he showed marked originality but was a misfit in the regular educational system. His mother indignantly removed him from school and instructed him personally because a teacher reported him to be "addled."

When about thirteen, he became a newsboy on the Grand Trunk Railroad and built a chemical "laboratory" in his corner of the baggage car. There he set up a small press and printed his *Weekly Herald*, which had about 400 paid subscribers. One day, young Edison's ears were soundly boxed and he was put off the train when he accidentally caused a fire. This marked the start of his lifelong deafness.

Undismayed, he learned telegraphy and, though only about fifteen, became a regular operator. His ability to work 20 hours a day enabled him to continue experimenting and he soon developed some noteworthy devices. However, he accumulated little money and could not even buy food when he arrived in New York in 1869. Fortunately, he found a way to turn his researches to profit and before he was twenty-two received over $40,000 for his inventions.

He used this money to establish a factory at Newark, N. J., and in 1876 he moved to Menlo Park, where he began the most dramatic period of his career.

Edison at the ore-concentrating plant at Edison, N. J. When this photograph was made, Edison had spent more than two million dollars of his own money on the development of his idea, and he had high hopes for its success, which hopes were never realized.



Edison's Edison Effect—to him merely an interesting phenomenon which had turned up in the course of his work on the incandescent lamp. Later the Edison Effect was recognized as the first thermionic tube or radio lamp. Without this "Edison Effect" your radio receiver would not work.

The phonograph, electric light, and scores of other important developments were announced in rapid succession. The enthusiasm of the leader spread to his associates and the whole group practically lived in the laboratory. Their greatest successes were achieved in the face of heartbreaking failures, organized opposition, financial difficulties, and even ridicule.

Mr. Edison was forced to sell many inventions to meet his heavy research expenses. He gave up all rights in his electric light at an early date and for the latter part of his life he had no connection with the great public utilities which still bear his name.

In 1887 he moved to West Orange, N. J. There he continued experimenting on a larger scale and also started extensive manufacturing operations. A great part of his fortune was lost when his plant for concentrating low-grade iron ore, at Edison, N. J., was made worthless by the discovery of rich deposits in the west, but he salvaged some of his machinery by entering the cement business. He received another severe blow when most of the West Orange factories burned in 1914, but characteristically, he started rebuilding while the fire still raged.

He served his country during the World War and spent the last years of his life trying to provide it with an emergency source of rubber. He lived to see a promising product of this last work and to celebrate the Golden Anniversaries of his greatest inventions.

Thirty-Ninth Annual Meeting

A LARGE representation of all branches of the mining industry attended the thirty-ninth annual meeting of the American Mining Congress held at the Waldorf-Astoria, New York City, January 26-27, 1937.

Beginning on the afternoon of Monday, January 25, the activities of the meeting opened with a session of the Social Security Committee under the chairmanship of Herbert Wilson Smith.

On Tuesday, January 26, the Resolutions Committee met at 9.30 in the morning and continued its deliberations throughout the day.

At the regular business meeting of members, Tuesday afternoon, Howard I. Young, American Zinc, Lead and Smelting Company, St. Louis, Mo., was re-elected as president of the Congress for the ensuing year. Reelected for a three-year term were Directors A. E. Benelari, Cincinnati, Ohio; A. B. Jessup, Jeddo, Pa.; D. D. Moffat, Salt Lake City, Utah; and Charles H. Segerstrom, Sonora, Calif. E. B. Greene, president, Cleveland Cliffs Iron Company, Cleveland, Ohio, was elected a director and vice president, succeeding John B. Putnam, of that city.

On Tuesday evening the Executive Tax Committee, under the chairmanship of H. B. Fernald, went into session for three hours, discussing matters of importance in Federal income taxation. Special consideration was given to the tax on undistributed earnings and to the situation of corporations burdened with debt and those wishing to make capital expenditures for plant, equipment, and development. Another matter which was discussed at length was the ruling by the Bureau of Internal Revenue affecting the tax on wages of contract miners under the Social Security Act. The Bureau has ruled that the tax shall be levied on the *gross* earnings of contract miners without deduction for explosives and other consumable goods and service charges other than labor. It was agreed by the committee that member companies should be consulted and that further representations should be made to the Commissioner of Internal Revenue, with a view to a correction of the ruling so that the tax will be levied upon wages paid for labor only.

At a luncheon meeting on Wednesday, January 27, presided over by Mr. Young, reports were made by officers and committees and resolutions were submitted for discussion.

In presenting his report, Secretary Julian D. Conover said in part as follows:

> "As you know, our organization comprises in its membership the various branches of the mining industry throughout the country. It serves as a medium for common expression of the interests of the entire industry—lead, zinc, copper, gold, silver, iron ore, bituminous coal, anthracite, sulphur, potash tungsten, phosphate, and other minerals—on the many national problems which today affect the welfare of mining.
>
> "By reason of its widespread mem-

A DECLARATION

TAXATION AND FINANCE

We endorse and reiterate the policies on taxation and finance approved by the American Mining Congress and its Western Division on January 15 and October 1, 1936, as follows:

"Deal fairly with the taxpayer in the enactment and administration of tax laws.

"Remove from the tax laws all provisions which repress and retard business enterprise, employment of workers and economic recovery.

"Amend the federal tax laws to reestablish the flat rate of corporation tax, to restore the right to make consolidated returns, to remove the tax on dividends received by corporations, to permit business losses of one year to be deducted from future income, to provide full allowance of capital losses, and to permit annual declaration of value for capital stock taxes, particularly in case of mining properties in the development stage."

"We condemn the principle of a penalty tax on undistributed earnings of corporations, embraced in the 1936 Revenue Act. This tax gives no consideration to the reasonable needs of the business. It retards the development of worth-while mining properties, cripples mining corporations which have incurred indebtedness for properties or improvements, prevents the expansion of facilities for treatment and utilization of the products of mines, and penalizes the accumulation of reserves needed to maintain payrolls and carry on the necessary operations of mining properties during periods of low earnings over which the industry has no control. It actually consumes capital that should properly and beneficially be expended for the legitimate purposes of the mining industry.

"We urge prompt reduction of government expenditures and balancing of the budget. Congressional control over expenditures must be reestablished.

"The proper function of the taxing power is solely to raise revenue for the necessary expense of government, and not as a means for redistribution of wealth.

"No manipulation of money or figures and no use of hidden or indirect taxes can change the fact that everybody pays taxes and that the people as a whole must produce and furnish to the government all that it spends. Continuation of the present rate of spending must inevitably bring about a broadening of the base for personal income and other direct taxation."

LABOR

The essential interest of employes and employers is to obtain efficient production through the cooperative efforts of labor, management and capital. Any interruption of this production results ultimately to the detriment of employes, employers and the consuming public.

We therefore urge that before any strike or lockout shall be resorted to in any labor dispute, the employes who are parties to the dispute and the employers, or their duly authorized agents, should first enter into negotiations and exhaust all reasonable and lawful means of reconciling their differences.

JUDICIARY

We deplore any movement tending to impair the authority or independence of the judiciary.

The American Mining Congress

OF POLICY

Howard I. Young
Reelected President

SOCIAL SECURITY

The mining industry views with concern the economic and social hazards involved in the ultimate accrual of a huge reserve fund under the existing provisions of the Social Security Act. We heartily concur with recent official suggestions that changes in the Act in this respect might be advisable.

We urge that Congress make a further study of the necessity for and the hazards in, the building up of the fund now prescribed in the Act.

We urge that the Bureau of Internal Revenue, in determining the wages of contract miners against which social security taxes are to be levied, apply the principle that such taxes be levied against that portion of payments made which represents wages for labor only.

GOVERNMENT IN BUSINESS

We urge that the Government retire from business in competition with its citizens.

RECIPROCAL TRADE AGREEMENTS

We heartily endorse the action of the State Department in connection with the treaty with Ecuador indicating that advance information will be given concerning the products to be considered for preferential treatment. We urge that any extension of the Reciprocal Tariff Act specifically provide that such advance public notice shall be given in every case, and opportunities for consultation afforded to employers, employes, and agricultural and any other groups affected.

SECURITIES AND EXCHANGE COMMISSION . .

The mining industry considers it of utmost importance to the public welfare that explorations and new developments should be encouraged because they are vital to the continuation of the industry. They do much to provide additional employment and furnish markets for other commodities.

The Securities and Exchange Commission should pass promptly upon applications for registration of mining securities. We urge the Commission to take immediate action to provide sufficient personnel to expedite the handling of registrations and to eliminate delays.

We approve heartily every appropriate means of informing the public of the character of securities offered for sale, but we earnestly object to disapproval of an issue to raise capital for prospecting and development of mineral lands on the ground merely that such enterprises are speculative.

PUBLIC DOMAIN

We endorse and approve the present system of locating mining claims and of granting patents. This system is well founded both in practice and in law, and for the future development of our country should be continued without change.

We urge that no hindrance be placed on the development of valuable mineral areas in the National Game Preserves and National Forests.

bership, the American Mining Congress is able to speak with authority concerning the needs of the mineral industry, and to represent it as an organized whole both before committees and members of Congress, and before government departments charged with the interpretation and application of laws to mineral production. The special character of minerals as wasting assets, the problems which confront the mining industry which are not common to other industries, make such representation especially needful in legislative, tax, and administrative procedure today. In the rush and confusion of present-day Washington, our problems will not receive intelligent consideration unless they are properly explained to those who make and enforce the laws.

"In representing the mining industries as a whole, we are benefited by the widespread geographic distribution of mineral production. In fully three-fourths of the states, mining constitutes an important industry, and in many of these, particularly in the West, mining is the dominant industry. Congressional representatives of these states are naturally interested in the needs of mining. Cooperation by mining men in presenting facts concerning proposed legislation to their senators and congressmen can be, and is frequently very effective in securing sound and constructive action. Eastern, southern, central, northern, and western mining all benefit from such cooperation."

This was followed by a resume of legislation of importance to the industry in the 74th Congress and a discussion of bills pending in the present session. The work of the operators committees engaged in studying modern mining practice, and the very successful conventions and expositions for the coal and metal mining industries, were also outlined. Further reports were received from Erle V. Daveler, chairman of the Finance Committee, and Henry B. Fernald, chairman of the Executive Tax Committee.

The report of the Resolutions Committee, presented in the form of a "Statement of Policy," was unanimously adopted and is presented herewith.

Coal's Convention

AS announced in January, the 14th Annual Coal Mining Convention and Exposition of the American Mining Congress will be held at Music Hall, Cincinnati, Ohio, May 17 to 21, 1937.

Under the direction of C. E. Cowan, vice president of J. H. Weaver & Company, who has accepted the Chairmanship of the Program Committee, the work is already taking form. Committees have been appointed and group meetings have already been held. In announcing the meeting, Julian D. Conover, Secretary of the American Mining Congress, submitted a questionnaire to more than 6,000 mining men asking their suggestions for topics for consideration. Sectional meetings of the Program Committee have been held at Pittsburgh, Pa., Charleston, W. Va. and Chicago, Ill. Final meeting of the Program Committee will be held about the middle of February and very shortly thereafter the first preliminary program will be released to the industry. Serving with Mr. Cowan as State and District Chairmen are the following: Pennsylvania (Bituminous), T. F. McCarthy, general superintendent, Clearfield Bituminous Coal Corp.; Ohio, F. G. Smith, assistant general superintendent, Sunday Creek Coal Co.; Illinois, G. Stuart Jenkins, general superintendent, Consolidated Coal Co.; Indiana, W. H. Stewart, general superintendent, Central Indiana Coal Co.; West Virginia, E. B. Agee, superintendent, Youngtown Mines Corp.; Kentucky, E. R. Price, mine superintendent, Inland Steel Co.; Virginia, J. J. Sellers, vice president, Virginia Iron, Coal & Coke Co.; Rocky Mountain, W. C. Stark, general manager, Blue Blaze Coal Co.; Southern Field, P. H. Haskell, Jr., general manager of mines, Alabama By-Products Corp.; Pennsylvania (Anthracite), C. A. Garner, Jeddo Highlands Coal Co.; (Midwest), Merle Kelce, Huntsville-Sinclair Coal Co.

Bruce G. Shotton
Chairman
Manufacturers Division

W. W. Dartnell, Valley Camp Coal Company, has accepted the chairmanship of the Committee on Arrangements. Membership upon this Committee is now being appointed. Chairmen of the subcommittees include: Newell G. Alford, Consulting Engineer, Pittsburgh; W. H. Cordes, American Steel & Wire Co., Chicago, Ill.; John C. Cosgrove, West Virginia Coal & Coke Co., Johnstown, Pa.; J. F. Coakley, Thomas A. Edison, Inc., East Orange, N. J.; H. B. Husband, Fuel Mines, C. & O. Railway, Dorothy, W. Va.; W. W. Rogers, Westinghouse Electric & Mfg. Co., Pittsburgh, Pa.; A. W. Fisher, McGraw Hill Publishing Co., New York City; W. D. Turnbull, Westinghouse Electric & Mfg. Co.; Bruce G. Shotton, Hendrick Mfg. Co., Pittsburgh, Pa. This group will Chair the subcommittees on "Welcome to Delegates," "Attendance," "Floor," "Publicity," "Contests," and "Entertainment."

W. D. Turnbull, Westinghouse Electric & Mfg. Co., will again assume responsibility for the entertainment features and with the record he established last year it is anticipated that this part of the convention will be most successful. L. W. Shugg, General Electric Co., will again serve as Director of Exhibits, and E. R. Coombes, assistant to the Secretary, American Mining Congress, will handle much of the detailed work of the convention. This meeting also marks the culmination of the year's work of the Coal Operators Committees, which have been making remarkable progress under the coordination of Glenn B. Southward, mining engineer on the Mining Congress staff.

A meeting of the Committee on Arrangements was held at Pittsburgh, Feb-

DISTRICT CHAIRMEN—PROGRAM COMMITTEE

W. C. Stark

Frank G. Smith

E. B. Agee

G. Stuart Jenkins

W. H. Stewart

J. J. Sellers

T. F. McCarthy

E. R. Price

A. C. Garner

Merle Kelce

OFFICERS OF THE MANUFACTURERS DIVISION

Wm. Goodman
First Vice-Chairman

Roy L. Cox
Second Vice-Chairman

Frank E. Mueller
Third Vice-Chairman

ruary 5, and many plans were advanced to make the coming meeting the most successful and valuable that has been held. The committee will start its publicity campaign immediately, and will keep the industry fully informed upon the progress being made. Special attention will be given to the entertainment program, and new and novel contests will be considered.

The exposition promises to break all records. Bruce G. Shotton, Hendrick Mfg. Co., is chairman of the Manufacturers Division of the American Mining Congress under whose auspices the exposition is staged. Floor plans are now in the hands of members of the Manufacturers Division, which represents 50 of the leading manufacturers of mining machinery and supplies. The American Mining Congress recently announced arrangements to materially increase the normal amount of space available at Music Hall. Added attractions to the exposition may be a Mineral States Exhibit presenting the coal resources of the United States, and there is a possibility of adding a stoker exhibit and modern truck equipment.

Julian D. Conover
Secretary, American Mining Congress

View of North Hall, 1936 Exposition

Mechanization Trends

Reports of Coal Operators Committees

A REVIEW of the COMMITTEE REPORTS in 1936

DURING the year 1936, the Coal Operators Committees have submitted sixty District Reports. In the early part of the year when the first reports were being prepared by the District Committees the data which they contained was largely in the nature of a survey, compiling the practices used by representative companies in the different fields. The purpose of this compilation was to find out what methods of operation were being most generally used, and it was intended that these reports should be preliminary in determining the nature of more detailed studies that were to be made later.

These detailed studies are now being made by the District Committees and the District Reports on each subject of mining will be used by the Project Committees as the basis for their National Project Reports. Each Project Report when completed will be the work of a number of men and such a report, including the major fields of the United States and reviewed and approved by men in each field, will comprise an authoritative treatise which can be accepted by mining men as containing the best thought and experience of the industry. While this end is in the future it is our belief that this future is not far distant, as the interest and the amount of work already done by the committees indicate an early completion of the Project Reports on the subjects now being studied. The Committee on Underground Power have already finished their first operating study—Direct Current Lines Underground—and this report has been sent to all members.

A general conference of the District Committees was held at Pittsburgh on January 31 and February 1, 1936. At this meeting the reports which had then been made were discussed with the idea of coordinating the work of the different districts and to be sure that all were proceeding along the same lines. In May, during the Cincinnati convention, the District and Project chairmen met—again for the purpose of reviewing what had been done and to decide on further procedure. On November 13 and 14, another general conference was held at Pittsburgh. By that time a sufficient number of District Reports had been made so that plans for the National Project Reports could be discussed and decided on. All of these meetings were well attended, and included representatives from the states of Pennsylvania, Ohio, West Virginia, Virginia, Kentucky, Indiana, Illinois and Wyoming.

The amount of constructive work that has been done by the committees and their willingness to furnish data has been extremely encouraging. The fact that a movement of this kind had never before been tried in the coal mining industry presented a number of difficulties when the committees were first organized. However, there was a decided agreement on the part of the members to make a start even though later experience should recommend that the first plans be modified. In keeping with this idea several minor changes from the original procedure and in the committee organization have been made during the year and further changes may be made in the future as our experience broadens and we know better than we do now just what information we want and just how it is to be gathered and presented.

The District Reports that have been submitted are copied in the Washington office and mailed to all the committee members, and during the year 1936 these reports were sent out at the approximate rate of one each week. The following resume describes briefly the work that has been done by the District Committees on each of the projects being studied, and also outlines the recommendations for the Project Reports that have been decided on by the National Project Committees.

Glenn B. Southward

Chairmen of the Coal Operators Committees

DISTRICT COMMITTEES

PENNSYLVANIA:
- **Central—R. G. Pfahler,** Berwind-White Coal Mining Co.
- **Pittsburgh—C. W. Gibbs,** Harwick Coal & Coke Co.
- **Southwest—A. W. Hesse,** Buckeye Coal Company.

WEST VIRGINIA:
- **Northern—W. W. Dartnell,** Valley Camp Coal Company.
- **Central—H. B. Husband,** C. & O. Fuel Mines.
- **New River—R. H. Morris,** Gauley Mountain Coal Co.

VIRGINIA: J. L. Osler, Blackwood Coal & Coke Co.

KENTUCKY:
- **Western—W. J. Borries,** Dawson Daylight Coal Company.

OHIO: R. V. Clay, Hanna Coal Company.

ROCKY MOUNTAIN: G. B. Pryde, Union Pacific Coal Co.

UTAH: Otto Herres, U. S. Fuel Company.

NATIONAL PROJECT COMMITTEES

FACE PREPARATORY: D. D. Wilcox, Superior Coal Co.

MECHANICAL LOADING—H. A. Treadwell, C. W. & F. Coal Company.

CONVEYOR MINING: T. F. McCarthy, Clearfield Bituminous Coal Corporation.

POWER DISTRIBUTION: M. W. Horgan, Monongahela West Penn Public Service Co.

SUBSTATIONS: Carl Lee, Peabody Coal Company; **C. C. Ballard,** New River Company.

MINING SYSTEMS: F. G. Smith, Sunday Creek Coal Co.

SURFACE PREPARATION: T. W. Guy, consulting engineer.

ACCIDENT PREVENTION: C. W. Connor, Nellis Coal Corp.; **William Crichton, Jr.,** Johnstown Coal & Coke Co.

MINE HAULAGE ROADS: R. V. Clay, Hanna Coal Co.

FACE PREPARATORY WORK

District Reports

THE first phase of face preparatory work to be studied was the subject of Cutting Bit Treatment, and the District Committees of Pennsylvania, West Virginia, Virginia, Illinois, Colorado, Wyoming and Montana have submitted reports for each of these fields. These reports were for the purpose of determining the general practices used and each district tabulated information showing general seam conditions, type of bit and bit treatment, performance records, and the following table extracts a few of the items submitted. This survey is preliminary to the final purpose of the Project Report which is to determine what have been proven to be the best practices for varying conditions encountered in the different fields.

TABULATION SHOWING TYPE OF BIT STEEL AND HEAT TREATMENT USED AS REPORTED BY DISTRICT COMMITTEES

	Material cut	Square ft. kerf cut mach. shift	Method of sharpening	Type of bit steel	Method of heat treatment
		Standard Pick Point Bits			
1.	Hard	2,080	Roller	Special analysis	Soapy boiling water
2.	Hard	2,040	Mechanical	Special analysis	Soapy boiling water
3.	Hard	1,754	Mechanical	.....	Tempering solution
4.	Bone	2,400	Mechanical	.....	Soapy boiling water
5.	Medium	1,764	Machine	Self tempering	Quenched by machine
6.	Medium	1,008	Machine	High carbon	Tempering solution
7.	Hard	3,000	Trip hammer	Low carbon	None
8.	Hard	460*	Roller	0.75 carbon	Oil and sand
9.	Hard	610†	Trip hammer	0.75 carbon	None
10.	Hard	1,500	Trip hammer	0.40 carbon	None
11.	Medium	1,275	Mechanical	High carbon	Water quenched
12.	Medium	1,400	Hand	Standard	Water quenched
13.	Medium	1,000	Hand	.....	.....
14.	Hard	864	Hand	.65-.75 carbon	.....
15.	Medium	1,200	Mechanical	.65-.75 carbon	Oil tempered
16.	Soft	1,320	Hand	.60-.90 mangan.	Oil tempered
17.	Hard	648	Mechanical	.....	Water quenched
18.	Hard	1,200	Mechanical		Moist sand
19.	Hard	900	Mechanical		Moist sand
		Plated or Tipped Bit Points			
20.	Medium	2,651	.....	.80 carbon .40 manganese	.....
21.	Hard	2,600	.....	.75 carbon	.....
22.	Hard	1,400	.....	low carbon	.....
23.	Hard	1,350	.....	.75 carbon	.....
24.	Hard	....	.....	.75 carbon	.....
		Patented Bit Points Not Resharpened			
25.	Medium	2,295	.....	.....	.....
26.	Hard	462	.....	.....	.....
27.	Hard	1,200	.....	.....	.....

* Vertical shear cut. † Breast machine.

Project Committee Meeting at Pittsburgh

At the general conference of the Operators Committees that was held in Pittsburgh on November 13 and 14, the following recommendations were submitted by the National Committee on Face Preparatory Work:

It was the opinion of the committee that the first requisite in reporting on performances of different types of bits, bit material and treatment is to have some method of comparing the hardness of the cutting in the various methods described. An arbitrary designation by the operator making the report, such as soft coal, hard, medium, etc., is not sufficiently definite because such classifications are a matter of opinion and do not give a true comparison between cutting qualities of coals in different fields or different seams in the same field.

It was therefore recommended that the first phase of the committee's work should be to prepare drawings that would show sections of the seams worked in the major coal fields and make a comparative classification between these seams as to their relative hardness in cutting. If this is done and if reports submitted on cutting bit treatment will specify the seam covered by the report, and will show in what part of the seam the cut is taken, then a fairly accurate comparison between the performances in different mines can be made.

It was also recommended that in addition to describing the type of bit treatment, performances, etc., the reports should definitely specify the bit lacing and the type of chain—showing the position of the bit, bit spacing, etc. In this connection it was recommended that a report should contain a screen test or some data showing the percentage of sizes in the machine cuttings with relation to the type of bit and the bit lacing.

Another recommendation was that the cutting speed of the machine—both the chain speed and the feed speed should be included in the data gathered.

Members Present

D. D. Wilcox, *Chairman*, Superior Coal Company; A. R. Anderson, Jeffrey Manufacturing Company; Max Forester, Consolidation Coal Company; A. E. Long, Clearfield Bituminous Coal Corp.; G. F. Osler, George S. Baton & Company.

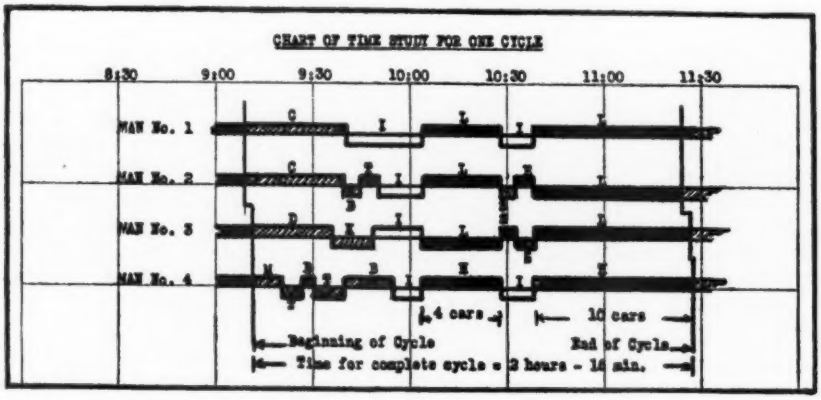
CONVEYOR MINING

District Reports

THE purpose of the district reports is to show typical successful methods used by representative companies in mining coal with conveyors and to explain how various factors have influenced design of the mining system, the selection of the equipment and the adoption of the operating practices. In order to do this it is necessary to have data and descriptions of a number of individual operations, showing mining plans with various widths of working faces and particularly covering the following five general methods.

Method No. 1. Single units loading into mine cars.

Method No. 2. Multiple units with a short gathering conveyor.



SUMMARY FOR ONE CYCLE

Key to Chart	Man minutes	Percent	Notes
C—Cutting	62	11.4	Shortwall—5½′ bar
K—Cleaning kerf	13	2.4	Room width—23 ft.
D—Drilling	25	4.6	Electric hand drill
B—Blasting—tamping	22	4.1	4 holes
T—Timbering	21	4.0	3 posts
P—Picking slate	..	..	42″ coal—No partings
L—Loading at face	213	39.3	18 tons=14 cars
H—Car trimming	74	13.4	Electric hoist
S—Supplies to face	8	1.5	.....
E—Extending conveyors	12	2.2	Chain type
R—Repairs	..	..	.....
M—Miscellaneous	11	2.0	.....
I—Idle	82	15.1	Smoke clearing, etc.
Total	543	100	

Submitted by T. F. McCarthy.

Method No. 3. Multiple units loading into a long gathering conveyor.

Method No. 4. Entry development.

Method No. 5. All conveyor from face to tipple.

For each of the above types of operation there is to be a separate report and the District Committees of Pennsylvania and Wyoming have already submitted descriptions of entry development and room mining. Reports from other districts are now in process of preparation.

Project Committee Meeting at Pittsburgh

At the general conference of the committees which was held in Pittsburgh, the Project Committee on Conveyor Mining recommended that methods of making time studies should be their next subject. They suggested that a standard form of time study should be adopted somewhat along the lines as shown in the chart submitted herewith. After this form has been approved by the committee printed blanks will be prepared and sent out.

Members Present

T. F. McCarthy, *Chairman*, Clearfield Bituminous Coal Corp.; L. T. Crawford, Goodman Manufacturing Co.; W. C. Fancourt, The Berwind-White Coal Mining Co.; E. B. Gellatly, Jeffrey Manufacturing Co.; L. H. Schneer, Consolidation Coal Co.

MECHANICAL LOADING

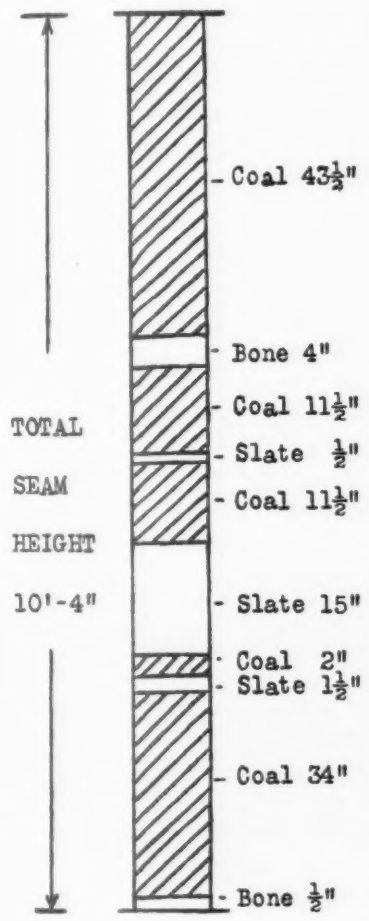
District Reports

THE first subject to be studied under this project was selected early in the year as "Mobile Mechanical Loaders in Seams with Partings," and reports on this type of operation have been submitted by the District Committees of Illinois, Ohio, and West Virginia.

In these operations the partings vary from a band 2" thick to a slate that is 15" thick. There is also in some of these mines a draw slate as much as 14" thick which has to be taken down and loaded. In some cases where the partings are thin the entire seam is loaded and the slate is removed at the tipple; in cases where the partings are thicker a large percentage of the impurities are removed underground.

The attached sketch is taken from one of the District Reports which describes mechanical loading in a seam that has a slate parting 15" thick. This main slate is handled entirely with mechanical loaders and the other partings in the seam are loaded with the coal and cleaned by hand at the tipple. At this operation the room and pillar system is used with entries 16′ wide and rooms 27′ wide. The usual working territory for one loading unit is 7 rooms, of which an average of 6 places are loaded each day.

The machine cut, with a cutter bar 11′ long, is made just above the main slate. Then the slate is shot enough to break it, after which the cutting machine rakes it out. The opening is then carefully swept out with a broom. After this is completed the mechanical loader either puts the slate into mine cars or gobs it, if space permits. When the above operations are completed the face of coal is shot down ready for the loader.



Project Committee Meeting at Pittsburgh

The Project Committee, which is under the chairmanship of H. A. Treadwell, C. W. & F. Coal Company, West Frankfort, Ill., prepared an outline for the future reports which includes the following general headings:

I. Description of Seam.
II. Sketch of Mining Plan.
III. Equipment.
IV. Operating Method.
V. Method of Cleaning Partings Underground.
VI. Average Performance for One Machine Shift.
VII. Surface Cleaning.

At the Pittsburgh conference the Project Committee recommended that the report should not be confined to operations in seams with partings, but should include descriptions of operations in all seams that are loaded mechanically. The Project Committee also recommended that under Section VII—"Surface Cleaning"—the report should not attempt to describe the surface operation in detail, but should merely state the type of cleaning method used.

The committee further recommended that an additional section, No. VIII, be included in the outline under the heading of "Method of Roof Control." The section should describe the timbering on the advance work, the special timbering for pillar extraction, the area of coal removed before the roof caves, and the percentage of coal recovery. These descriptions should be illustrated by sketches.

Members Present

A. W. Hesse, *Acting Chairman*, Buckeye Coal Co.; L. B. Abbott, Consolidation Coal Co.; J. A. Saxe, Industrial Collieries Corp.; Chas. C. Whaley, Myers-Whaley Co.

UNDERGROUND POWER

District Reports

THE subject selected for the first study under this project was Distribution Lines for Direct Current and reports on practices in their fields were submitted by the District Committees of West Virginia, Illinois, Pittsburgh, and Ohio. The following tabulation compiled by the National Project Committee is extracted from these reports.

Project Committee Meeting at Pittsburgh

The Committee on D. C. Distribution Lines announced that their Project Report was completed and approved and was ready to be sent out to all committee members. This Project Report contains a table showing general practices in six of the major coal fields, and discusses these practices and draws certain conclusions from them. The report also contains the following four charts: (a) Curves showing the resistance of mine tracks with rails of various sizes, (b) Curves showing kw. load delivered over various distances through different sizes of conductors and returns, (c) Curves showing voltage drop for various sizes of conductors at different values of current, (d) Curves showing kw. loss at various values of current for different size conductors.

The Committee on Substations have started their report by preparing a set of curves showing the economic distance at which various power loads can be transmitted from a substation. The purpose of this chart is to indicate when it is more economical to increase the sizes of the conductors and when it is more economical to move the substations closer to the point of power use.

Members Present

M. W. Horgan, *Chairman*, Monongahela West Penn Public Service Co.; vice chairman, C. C. Ballard, The New River Company; J. E. Borland, Westinghouse Electric & Mfg. Co.; F. P. Brightman, General Electric Co.; H. P. Chandler, Ohio Brass Co.; J. M. Connor, West Penn Power Co.; C. W. Gibbs, Harwick Coal & Coke Co.; H. A. Randall, Harwick Coal & Coke Co.; D. E. Renshaw, Westinghouse Elec. & Mfg. Co.; F. L. Stone, General Electric Co.

COMPILATION OF DISTRICT REPORTS ON DIRECT CURRENT DISTRIBUTION LINES

General conditions	Northern W. Va.	New River,	Pittsburgh,	Illinois	Ohio	Central West Va.
Average daily tonnage	2,500	1,900	2,100	4,000	3,100	1,388
Percent power generated	None	60%	None	24%	17%	12.5%
Percent power purchased	All	40%	All	76%	83%	87.5%
Max. distance DC circuit	6,000 to 15,000'	4,000 to 10,000'	9,000 to 12,000'	2,000 to 8,000'	7,000 to 15,000'	7,500 to 13,000'
Allowable voltage drop	20% average 30% highest	15% average 20% highest	16½% average 18% highest	21% average 25% highest	20% average 27% highest	12.5% average 20% highest
Average KW. load DC	220 average 400 highest	556 average 700 highest	600 highest	895 average 1,500 highest	658 average 1,200 highest	412.5 average 800 highest
Distribution lines	*	*	*	*	*	*
Main haulage trolley	6/0 60% 4/0 40%	6/0, 60% 4/0, 40%	6/0 33% 4/0 67%	6/0 30% 4/0 70%	6/0 33% 4/0 67%	6/0–9/0 20% 4/0 80%
Main feeder lines	2,000,000 20% 1,000,000 40% 750,000 20% 6/0 20%	1,000,000 20% 900,000 20% 500,000 40% 4/0, 20%	1,000,000 67% 4/0 33%	1,000,000 20% 750,000 20% 3–4/0 40% 1–4/0 20%	1,500,000 33% 1,000,000 17% 750,000 33% 500,000 17%	1,750,000 25% 1,500,000 12½% 1,000,000 12½% 500,000 25% None 25%
Length beyond feeder	3,500 to 6,500'	2,000 to 7,500'	900 to 4,000'	2,000 to 4,500'	.....	.....
Spacing feeder tie-ins	20 to 250'	200 to 333'	20 to 500'	500 to 4,000'	15 to 1,320'	20 to 1,000'
Main haulage rail	60 lb. 60% 40 lb. 20% 30 lb. 20%	75 lb. 20% 60 lb. 30% 45 lb. 20% 40 lb. 20% 30 lb. 10%	60 lb.	90 lb. 10% 56, 60, 50% 40 lb. 20% 30 lb. 20%	70 lb. 17% 60 lb. 50% 40 lb. 33%	60 lb. 62½% 55 lb. 12½% 50 lb. 12½% 40 lb. 12½%
Main haulage bonds	Both rails	Both rails	Both rails	Both rails 80% Rails welded 20%	Both rails	Both rails
Cross bond spacing	100 to 300'	200 to 300'	200'	.....	.....	.....
Negative feeders used	Yes, 60%;	Yes, 60%;	No	Yes, 40%;	Yes, 50%;	Yes, 62½%;
Gathering trolley wire	4/0 80% 2/0 20%	4/0	4/0	4/0, 50%; 40% battery loco.	4/0	4/0 80%
Gathering feeder line	4/0 to 750,000	4/0, 20%;	4/0, 33%;	4/0 or storage battery loco.	4/0 500,000 CM None 33%	4/0 25% None 75%
Gathering haulage rail	20 lb. to 40 lb.	20 lb. to 30 lb.	30 lb. to 40 lb.	20 lb. to 30 lb.	20 lb. to 40 lb.	20 lb. to 40 lb.
Gathering rail bonds	Wire return, 80% Bonds, 20%	2/0 to 4/0 both rails	Both rails 33% One rail 67%	2/0 to 4/0 60% Battery loco. 40%	Both rails 17% One rail 17% None 66%	One rail 87½% None 12½%
Voltage drop checked	Yes, 80%;	Yes, 60%;	Yes, 67%;		Yes, 34%;	Yes 100%
Worn trolleys replaced	Yes	Yes	Yes, 33%;		Yes	Yes, 62½%;
Size trolley preferred	6/0, 60%;	6/0	6/0, 33%;	6/0	6/0, 67%;	6/0
Prefer trolley shoes	Yes, 60%	Yes	Yes, 33%	Yes	Yes 67%	Yes 50%
Prefer trolley wheels	Yes, 40%		Yes, 67%		Yes 33%	Yes 50%

* Percentages refer to the number of mines covered by district report.

SAFETY

District Reports

REPORTS have been submitted by the District Committees of Pennsylvania, Ohio, West Virginia, Illinois, Wyoming, and Montana, giving a general survey on safety practices for each of these districts. These reports tabulated the experience of representative companies on safety education, safety meetings, protective clothing, and methods used to build up safety organizations and prevent accidents. A summary of these reports is to be compiled.

Project Committee Meeting at Pittsburgh

The committee decided that their next subject would be to determine in detail what were the successful methods used in the different fields to promote safety education and activities between employer and employes. An outline was prepared to submit to the District Committees to be followed by them in preparing their reports. This outline is submitted below.

1—*Endorsement and Approval of Executive officials*

Describe what the executive officials do toward increasing safety.

2—*Executive Safety Committee*

Describe personnel, duties, responsibilities, and general procedure.

3—*Safety Departments*

Describe organization, personnel, duties, and authority and under whose direction the safety department operates.

4—*Local Safety Unit*

Describe personnel, organization, meetings and duties.

5—*Safety Rules*

List not more than 15 fundamental or basic safety rules.

6—*Safety Meetings*

Describe different types of meetings, where held, frequency and program.

7—*Education and Instruction*

List or describe specific things done to promote safety education and instruction.

8—*Physical Examinations*

Applied to what class of labor—frequency of examinations—made by whom—to what extent do physical examinations limit the employment of men?

9—*Discipline*

How rigidly are safety regulations enforced? What disciplinary measures are found effective? Are bonuses found satisfactory? Explain methods of giving bonues.

10—*Responsibility*

Methods of fixing the responsibility for an accident.

11—*Safety Clothing*

What method is used to introduce protective clothing i. e. compulsory or voluntary?

12—*Cooperation*

How do local units cooperate with state and federal safety departments? What methods are used to get employe cooperation?

Members Present

William Crichton, Jr., *Chairman*, Johnstown Coal & Coke Co.

Chairman—Charles W. Connor, Nellis Coal Corp.; M. L. Coulter, Clearfield Bituminous Coal Corp.; R. M. Hartman, West Virginia Compensation Commission; P. D. McMurrer, West Virginia Department of Mines; J. T. Ryan, Mine Safety Appliances Co.; J. J. Sellers, Virginia Iron, Coal & Coke Co.; Charles E. Vawter, The Gauley Mountain Coal Co.

SURFACE PREPARATION

District Reports

THE first subject selected for study under this Project was De-watering Washed Coal, and the District Committees of Pennsylvania and West Virginia have submitted a total of seven reports describing installations in those states. These reports are very complete in presenting data and descriptive notes covering the sizes of coal de-watered, the type of equipment, and the results obtained. The following general outline was used:

I. General
- District or Field
- Coal Seam
- Bed Moisture

II. Moisture Sampling
- Special Moisture Samples
- Container for Samples
- Crush? Size?
- Time and Temperature of Drying
- Was sample air or oven dried?
- Moisture per cent added to analysis?

III. Sizes De-Watered
- Sizes
- Type of De-Watering Units
- Per cent of Moisture

IV. De-Watering Surfaces
- Material
- Openings
- Percent Open Area
- Life Months
- Area Sq. Ft.
- TPH Sq. Ft. Over
- TPH Sq. Ft. Through
- RPM
- Stroke inches Hor.
- Pitch

V. Heat Drying

VI. Air Drying

VII. Moisture in Combinations of Sizes De-Watered

Project Committee Meeting in Pittsburgh

The committee reported that they had received a number of District Reports on "De-Watering Washed Coal," and they would soon be ready to compile their National Project Report.

A discussion of the terms "Inherent Moisture" and "Bed Moisture" brought out the fact that there is no agreement on how this value should be determined. It was recommended that in reporting inherent moisture, or surface moisture, the process of sampling and analysis should be described in detail. The difference between air drying and oven drying was also discussed, and it was recommended that a report should definitely specify how the drying was done.

The next subject selected for study is "Screening Small Sizes," and a data sheet for collecting this information was adopted. The committee stressed the need for standardizing the terms used to describe screen sizes, and recommended that the report should describe a screen performance by giving the percentage of oversize and of undersize in the screened product.

Members Present

T. W. Guy, *Chairman*, Consulting Engineer; J. J. Coffey, Bird Coal Company; C. L. Day, Valley Camp Coal Company; G. R. Delamater, The W. S. Tyler Company; A. C. Dittrick, Hanna Coal Company; H. L. Griffin, Koppers Coal Company; F. A. Jordan, Youngstown Sheet & Tube Company; Bruce G. Shotton, Hendrick Manufacturing Company.

MINING SYSTEMS

District Reports

MINING Systems used with hand loading was the subject selected for study under this Project and reports have been received from West Virginia, Ohio, Pennsylvania, and Utah. In making these reports the general outline as given below was followed as far as practical.

General Conditions

Seam height, character of top, depth of cover, pitch. Faults or irregularities which affect the mining system.

Types of Equipment

For cutting, drilling, gathering. Capacity of mine car.

Plan of Mining System

Sketch typical panel with general dimensions and showing method of entry development, room advancement and pillar recovery.

Factors Determining the Mining System

What determines the length of butt entries, room length, and the number of rooms working simultaneously on an entry?

What determines the width of a working place such as top condition, capacity of hand loader, reach of track cutting machine, etc.?

Performance Data

Show the percentage produced from (a) entry driving, (b) room driving, (c) pillar recovery. What is the percentage of coal recovery made over a complete panel?

For developing and mining to exhaustion one average or typical butt entry, the complete cycle is divided into the following three periods:

1. Period of development to full production.
2. Period of full production.
3. Period of declining production.

For each of the above periods show

(a) number of working shifts, (b) average tonnage per shift, (c) number of working places per shift.

Changes in Mining System

What changes have been recently made in the mining system to concentrate production and increase tonnage in a panel?

What modifications have been caused by recent changes in the types of equipment for cutting, shearing, drilling, gathering, etc.?

Factors Affecting Further Concentration

Is further concentration and increased tonnage from a panel contemplated?

Project Committee Meeting in Pittsburgh

The committee reported that they had received a number of reports on hand loading mining systems, and will soon be ready to compile these into a national report. Following this, their next subject will be mining systems with mechanical loading and mining systems with conveyors.

In connection with studies on hand and mechanized loading systems the committee felt that they should pay particular attention to methods of pillar recovery. They proposed to gather available data on the various methods used such as open end, cross cuts, slabs and splits. They also proposed to cover examples of long wall and long face mining.

A discussion on mining systems with mechanized loading brought out the fact that changes which had been made from hand mining methods had resulted in a higher percentage of recovery and a greater width of the working places than in hand loading. So far these changes are modifications of hand systems, but the committee feels that some radical departures from present mining systems may be made in the future.

Members Present

Frank G. Smith, *Chairman*, Sunday Creek Coal Co.; Frank Dunbar, Mather Collieries; C. A. Siemon, Hillman Coal & Coke Co.

COAL MINE HAULAGE ROADS

THE purpose of this committee is to compile haulage construction and maintenance practices used at a number of representative coal mines and in making this study the committee recognizes that no one single method of track construction will produce the most satisfactory results under all the variable conditions that are encountered in coal mining. It is therefore the plan to investigate different types of construction materials and different construction methods. In making these studies the following three subcommittees have been appointed:

Subcommittee on Road Beds and Location—to report on alignment, cross section, grades, subgrade, ballast, drainage.

Subcommittee on Ties—to report on wood ties, steel ties.

Subcommittee on Rail and Track Accessories—to report on rails, rail joints, accessories.

Project Committee Meeting at Pittsburgh

The committee reported that considerable progress had been made in the compilation of the data by the three subcommittees. Before completing the national report the committee plans to visit and inspect a number of mines so that their findings will be based on personal field observation in addition to other data gathered.

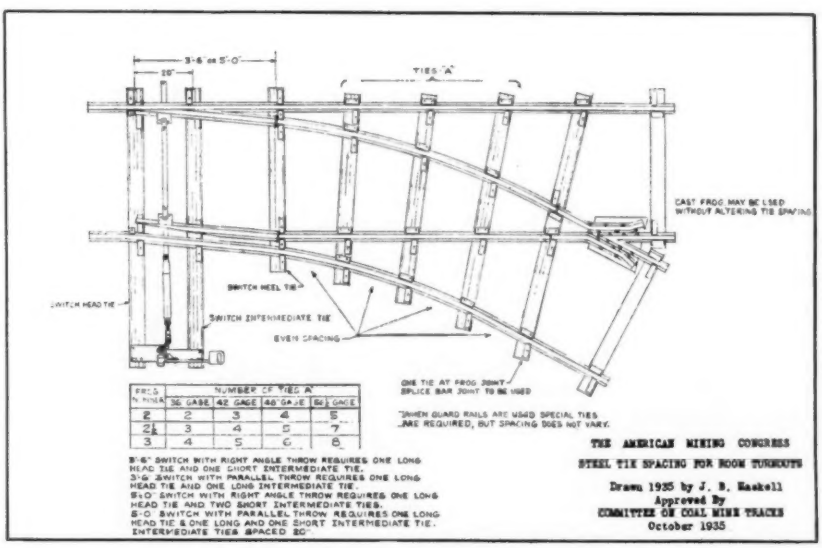
The Subcommittee on Ties has submitted their preliminary report on the use of tie plates on treated main haulage ties. This report contains tables showing strengths, working stresses, etc., for different kinds of wood, different sizes of rail and various wheel loads, and presents a discussion of the factors affecting the use and selection of proper track material. The Subcommittee has also prepared a data sheet which will compile practices used by the representative coal companies in the different fields.

The Subcommittee on Rail and Track Accessories have submitted their preliminary report which shows weight, section, and rail drilling for main line haulage tracks. This report discusses the various factors involved in selecting the proper size rail and track accessories for different weights of haulage equipment.

Members Present

R. V. Clay, *Chairman*, Hanna Coal Company.

Chairman—Subcommittee on Ties—A. R. Joyce, Wood Preserving Corp.; M. D. Cooper, Hillman Coal & Coke Co.; J. Ray Ulrich, Bethlehem Steel Co.


TIES "A"
CAST FROG MAY BE USED WITHOUT ALTERING TIE SPACING
SWITCH HEEL TIE
SWITCH HEAD TIE
SWITCH INTERMEDIATE TIE
EVEN SPACING
ONE TIE AT FROG JOINT
SPLICE BAR JOINT TO BE USED
"WHEN GUARD RAILS ARE USED SPECIAL TIES ARE REQUIRED, BUT SPACING DOES NOT VARY.
NUMBER OF TIES 'A'
36 GAGE
42 GAGE
48 GAGE
60 GAGE
THE AMERICAN MINING CONGRESS
STEEL TIE SPACING FOR ROOM TURNOUTS
Drawn 1935 by J. B. Haskell
Approved By
COMMITTEE ON COAL MINE TRACKS
October 1935

Sales of MECHANICAL LOADING and CLEANING EQUIPMENT for Use in Coal Mines in 1936[1]

By L. N. PLEIN and F. G. TRYON[2]

A SUBSTANTIAL increase in both mechanical cleaning and mechanical loading equipment was made at the coal mines of the country in 1936. Complete statistics of the tonnages produced by such devices will not be available for some months, because of the time required to canvass the 7,000 mines in the bituminous and anthracite industries. Meanwhile, however, the trend is shown by manufacturers' reports of sales of equipment made during the year. Installations of mechanical cleaning equipment were made at 36 tipples in the bituminous coal fields, with a total capacity of 5,800 tons an hour, or conservatively 8,000,000 tons a year. Sales of mobile loading machines and of conveyors established a new record.

MECHANICAL CLEANING OF BITUMINOUS COAL

Reports from the manufacturers indicate that installations of mechanical cleaning equipment were made in the bituminous fields of ten states. In 1935, a total of 45,361,021 tons, or 12.3 percent, of the bituminous output was mechanically cleaned by wet or pneumatic methods. The 1935 figures, however, did not disclose the full extent of the capacity then installed because a number of plants did not go into operation until late in the year. This fact, coupled with the current increase in national production and the construction of new plants, makes it certain that the final record for 1936 will show a marked advance in both tonnage and percent mechanically cleaned.

In Pennsylvania, three new plants started in 1935, but only operated part of the year. It is presumed that they operated a full year in 1936, thus adding materially to the output for the State. In 1936, three entirely new plants were constructed, and additions were made to three existing plants. The total capacity of this added construction, as reported by the manufacturers, is 430 tons of coal per hour. One new plant was under construction in January, 1937.

In West Virginia, six new plants started in 1935. Eleven new plants were constructed in 1936, and two additions were made to existing plants. The 1936 construction represents a capacity of 1,800 tons per hour. Early reports for 1937 indicate that about 900 tons per hour capacity was under construction in January.

In Illinois, five rather large plants, with a total capacity of 1,900 tons per hour, started in 1935. In 1936, six new cleaners were completed, with an hourly capacity of 2,030 tons, and 430 tons of capacity was under construction in January, 1937. Thus, Illinois which had been forging to the front in 1934 and 1935 should show another large increase for 1936.

There was little activity in Alabama other than the addition of wet tables to existing washeries.

In Indiana, one large plant started operation late in 1935, another was scheduled to start in January, 1936, and a third late in the year. These three plants represent an added capacity of about 700 tons per hour.

No new completions were reported in Kansas, but in Missouri, two plants were under construction in 1936, which will add 500 tons per hour to that state's coal cleaning capacity.

In Ohio, one new plant with a reported capacity of 250 tons per hour started in 1936.

In Washington, about 250 tons hourly capacity was added in December, 1935, and in the course of 1936.

Other construction which should add to the tonnage mechanically cleaned was reported in Kentucky, Tennessee, and Virginia.

The activity in mechanical cleaning points to steady improvement in quality of the coal marketed. Despite the increase in fixed charges and often in labor which it entails, mechanical cleaning is believed to stregthen the industry's position in competition with other fuels.

MECHANICAL LOADING

Total Units Sold—A substantial increase in installations of mechanical loading devices is indicated by the manufacturers' sales in 1936. Reports courteously furnished by 28 manufacturers are summarized in Table 1. Sales of mobile loaders reached a total of 344 units, nearly treble the figure for 1935 and larger than that reported in any previous year. Sales of conveyors were reported as 972 units, an increase of 47 percent over the year preceding. Sales of scrapers or scraper hoists increased 27.3 percent. Sales of pit-car loaders, on the other hand, were less than in the year before.

Total Sales by States—Shipments of mechanized loading devices of one type or another were made to 19 states in 1936. Nearly every important producing state is represented in the list. In many of the smaller states, it is impossible to show the number of machines of each type sold without disclosing the business of individual manufacturers. Table 2, however, gives the total number of units shipped to each state or region during the year. The kinds of machines sold

TABLE 1.—UNITS OF MECHANIZED LOADING EQUIPMENT SOLD TO ANTHRACITE AND BITUMINOUS MINES, AS REPORTED BY IDENTICAL MANUFACTURERS, 1933 TO 1936, INCLUSIVE.

	1933	1934	1935	1936	Percent increase (+) or decrease (—) 1936 over 1935
Mobile loaders	41	55	115	344	+199.1
Scrapers	65	34	22	28	+ 27.3
Conveyors *	384	596	661	972	+ 47.0
Pit-car loaders	18	26	28	11	— 60.7

* Includes hand-loaded conveyors and conveyors equipped with duckbills and other self-loading heads.

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[2] Coal Economics Division, U. S. Bureau of Mines, Washington, D. C.

are indicated in a parellel column, the abbreviation L standing for mobile loaders, S for scrapers, P for pit-car loaders, and C for all other types of conveyors including those equipped with loading heads. The several types are arranged in the rough order of their capacity. Thus, for the state of Ohio a total of 72 units is shown, followed by the letters L, C, and P, indicating that the highest capacity was in the form of mobile loaders, followed by conveyors and pit-car loaders.

TABLE 2.—TOTAL NUMBER OF UNITS OF MECHANIZED LOADING EQUIPMENT SHIPPED FOR USE IN EACH STATE OR REGION IN 1936.

L=mobile loading machines.
P=pit-car loaders.
S=scrapers.
C=conveyors, including those with duckbills.

	No. of units of all types shipped in 1936	Types of equipment in approximate order of capacity
Bituminous		
North'n Appalachian States:		
Pa.—Western	93	L, C
Pa.—Central; and Md.	53	C, L, S, P
Ohio	72	L, C, P
South'n Appalachian States:		
W. Va.—Northern	87	L, C
W. Va.—Southern	258	L, C, S
Virginia	41	C, L, S
Eastern Ky.*	41	L, C
Ala. and Tenn.	71	C, S, L, P
Middle Western States:		
Illinois	98	L, C
Indiana	38	L, C, P
Trans-Mississippi States:		
Ark., Iowa, and Okla.	39	C, S
Colo. and N. Mex.	71	C, L
Mont. and Wash.	10	L, P, C
Utah	12	L, C
Wyoming	48	C, L
Total bituminous	1,032	L, C, S, P
Anthracite		
Pennsylvania	323	C, S, P
Grand total	1,355	L, C, S, P

* Includes a few units in western Kentucky.

TABLE 3.—NUMBER OF BITUMINOUS COAL MINING COMPANIES PURCHASING NEW MECHANIZED LOADING EQUIPMENT IN 1936*

	Buying mobile loaders: Comp'ies that USED mobile loaders in 1935	Buying mobile loaders: Comp'ies that DID NOT USE mobile loaders in 1935	Buying conveyors†: Comp'ies that USED conveyors in 1935	Buying conveyors†: Comp'ies that DID NOT USE conveyors in 1935
Northern Appalachian States:				
Pennsylvania and Maryland.	3	15	6	10
Ohio			..	12
Southern Appalachian States:				
West Virginia and Virginia	5	30	14	29
Kentucky	2	6	4	14
Alabama				
Tennessee	..	..		
Middle Western States:				
Illinois	13	11	2	2
Indiana	7			
Trans-Mississippi States:				
Ark., Colo., Iowa, N. Mex., Okla., Utah., Wash., Wyo.	9	..	9	03
Total bituminous	39	62	35	87

* In addition, eight companies bought scrapers, of whom three used scrapers in 1935 and five did not. Also, five companies bought pit-car loaders, of whom two used pit-car loaders in 1935 and five did not.

† Includes conveyors equipped with duckbills and other self-loading heads, and hand-loaded conveyors other than pit-car loaders.

Installations vs. Replacements—A point of much interest to manfacurers is the extent to which sales of equipment represent replacement of old machines, as opposed to new installations. The information collected did not separate replacements accurately, but some light on the question is thrown by classifying the purchasing companies into those which had made use of equipment of the type sold during the preceding year and those which had not. This is done in Table 3. Thus, it was found that a total of 101 bituminous coal-mining companies had received shipments of mobile loaders in 1936. Of these, 39 companies had made use of mobile loaders during the year 1935. There were, however, 62 other companies buying mobile loaders in 1936 who used none in 1935. The separation is not clear-cut, since numerous mining companies that used mobile loaders in 1935 bought more machines in 1936. On the other hand, there were doubtless mines that purchased machines in 1936 to replace loaders which had been bought some years ago and were not used in 1935. The table, however, is sufficient to indicate that the bulk of sales in 1936 undoubtedly represented additions rather than replacements.

A similar conclusion is indicated by the record of sales of conveyors.

TABLE 4.—SALES OF MECHANIZED LOADING EQUIPMENT IN 1936 COMPARED WITH TOTAL NUMBER OF MACHINES IN ACTIVE USE IN PRECEDING YEARS.

	Number of machines in active use, as reported by mine operators: 1928	1929	1930	1931	1932	1933	1934	1935	No. of machines sold in 1936 as reported by 28 manufacturers
Bituminous mines:									
Mobile loading machines	397	488	545	583	548	523	534	657	344
Scrapers	130	126	150	146	128	93	119	78	19
Pit-car loaders	1,040	2,521	2,876	3,428	3,112	2,453	2,288	2,098	9
Conveyors equipped with duckbills, and other self-loading heads	82	99	140	165	159	132	157	179	660†
Hand-loaded conveyors—									
Number of conveyor units	*	*	*	*	*	525	574	670	
Number of mines at which used	119	130	142	152	136	114	114	136	116‡
Anthracite mines (Pennsylvania):									
Mobile loading machines	302	350	384	5	11	18	14	1	...
Scrapers				457	479	455	517	507	9
Pit-car loaders				28	24	19	25	22	2
Conveyors equipped with duckbills, and other self-loading heads	184	355	421	1	17	12	13	30	312†
Hand-loaded conveyors, number of units				547	818	940	1,338	1,563	

* Number of units not reported in these years.

† Reported as "conveyors (room, face, and entry)," "shaker drives," and "duckbills." The figures of number sold in 1936 are not exactly comparable with the number in use in 1935, because of uncertainties in defining what constitutes a conveyor.

‡ Represents number of bituminous mining companies to whom conveyors were sold in 1936. Of these, 32 companies were mining with conveyors in 1935 and 84 were not.

Units Sold Compared With Units in Use—The changing demand for the several major types of equipment is indicated in Table 4. The number of mobile loaders in active use, as reported by mine operators, increased from 397 in 1928 to 657 in 1935. The sales of 344 mobile loaders made during 1936 was thus equivalent to more than half the total number previously in use. Sales of conveyors in 1936 likewise constituted a large fraction of the number previously installed, as reported by the operators, especially in the bituminous fields. Because of uncertainties in definition of what constitutes a conveyor, the record of sales is not wholly comparable with the record of number previously in use, but the fact of a large increase is clear. The number of scrapers sold, despite the increase over 1935 sales, was comparatively small when viewed against the numbers previously used. In the bituminous fields, the number of scrapers in use reached a peak in 1930 and has since declined. In the anthracite fields, the number of scrapers continued to increase down to 1934, declining slightly in 1935. The installations of pit-car loaders reached a maximum in 1931 and have since declined in both the bituminous and anthracite mines.

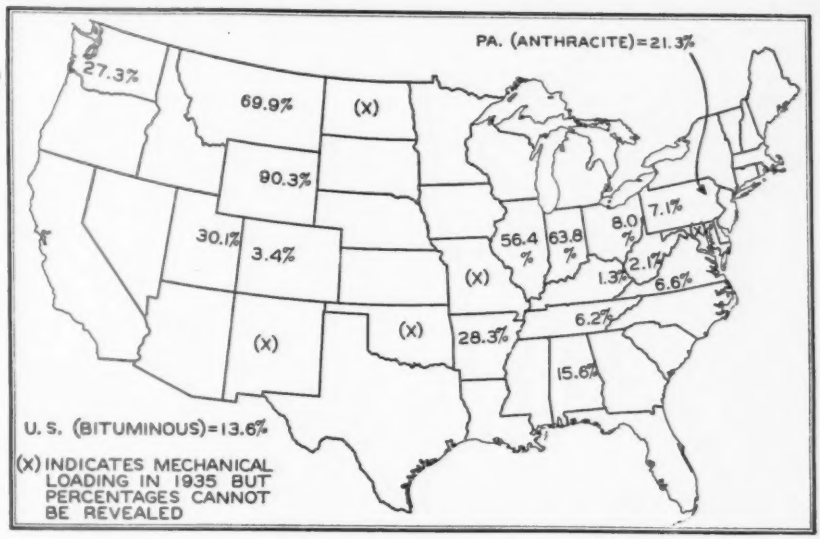

Figure I—Degree of mechanization in 1935, as indicated by the percent of the total deep-mined output mechanically loaded.

Percent of Deep-Mined Output Mechanized—Figure I shows the percentage of the output of underground mines that was loaded with the aid of mechanical devices in 1935. The figures include coal handled on pit-car loaders and hand-loaded conveyors as well as with mobile loaders, scrapers, and duckbills. In the past, the geographical distribution of mechanical loading has been much affected by physical conditions and by differentials in wage rates. The areas where mechanization had advanced furtherest down to the end of 1935 were the states of the Northern Rocky Mountains, Illinois, and Indiana, areas where seam conditions were favorable and where during the period from 1923 to 1933 wage rates, by comparison with the southern and eastern fields, were relatively high. In 1935, over 90 percent of the deep-mined output of Wyoming

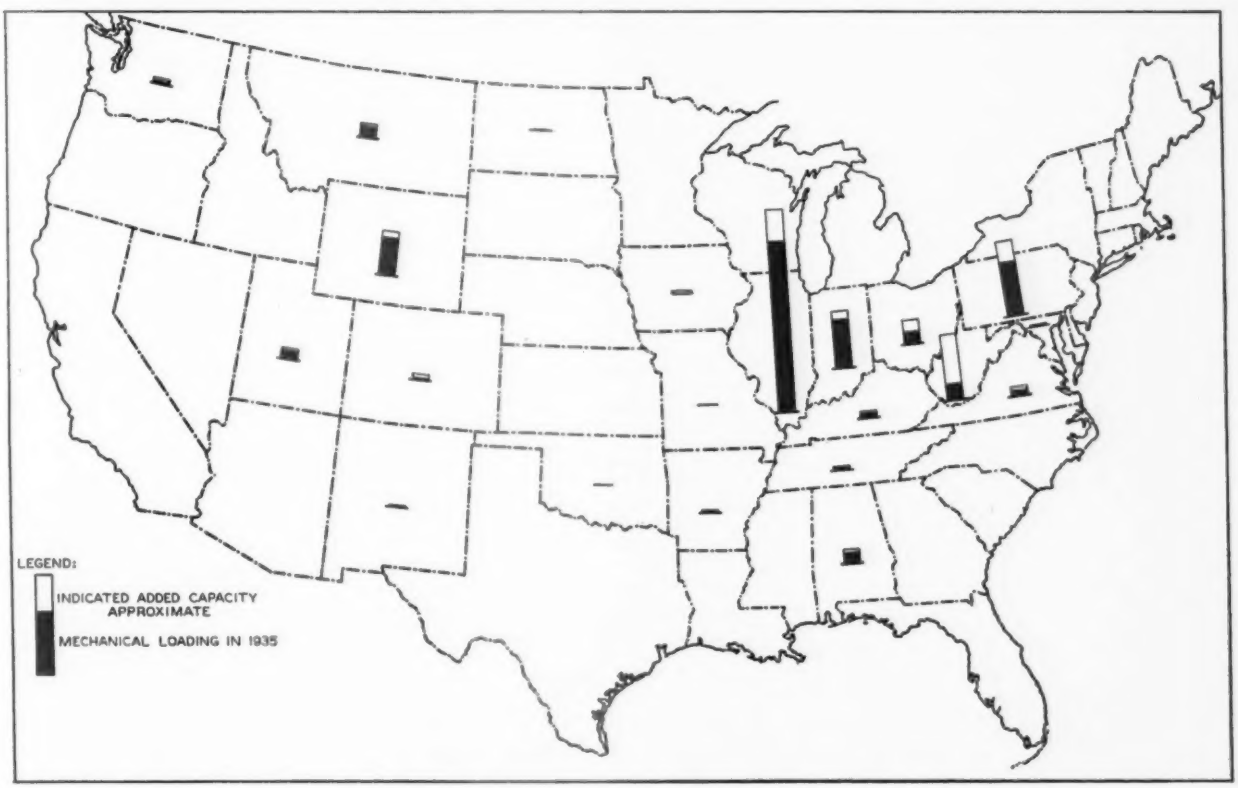

Figure II—Tonnage mechanically loaded in 1935 and approximate capacity of new equipment shipped in 1936.

was mechanically loaded. In Montana, the proportion was 69.9 percent, in Indiana, 63.8 percent, and in Illinois, 56.4 percent. In the Appalachian states, on the other hand, the proportion mechanically loaded was much smaller, though a few companies had successfully applied mechanization there, also. In 1935, the proportion of the West Virginia output mechanically loaded was 2.1 percent and that of Kentucky 1.3 percent.

Regional Distribution of Mechanized Capacity—Recently, market conditions and the trend of wage rates have tended to stimulate mechanization in the Appalachian region, and a large part of the sales of equipment reported by manufacturers in 1936 went to the eastern and southern fields. Figure II shows, in generalized form, the regional distribution of sales in relation to pre-existing capacity. In this map the tonnage loaded mechanically by all devices in 1935 is shown by the black columns. To these have been added in white a rough indication of the capacity of the equipment purchased in 1936.[1] Accurate figures of the increase in actual tonnage mechanically loaded must await the detailed reports of mine operations during the year, but in the meanwhile the map may suffice to indicate the areas where sales of equipment were most active.

The largest installations of mechanical loading equipment seem to have been made in West Virginia. In that state, the monthly report of the State Department of Mines gives a current record of the increase in tonnage mechanically mined. From January to November, 1936, a total of 2,077,901 tons of coal was loaded on conveyors in the state, and 5,365,796 tons was produced by mobile loaders, scrapers, and other devices eliminating hand shoveling. The total loaded with the aid of mechanical devices was thus 7,443,697 tons for the 11 months' period, indicating that the year as a whole may show a figure as high as 8,500,000 tons. In 1935, the total for the state, as reported to the United States Bureau of Mines, was 2,059,322 tons.

The data so far available to the authors are not sufficient to attempt an estimate of the total tonnage mechanically loaded in the bituminous coal industry in 1936. Mr. Eugene McAuliffe has recently stated, "When 1936 figures are made available . . . a possible total of 60,000,000 tons may be shown."[2]

Loader and Scraper Sales by Regions—It is not possible to show the sales of each type of equipment in every state, without disclosing the business of individual manufacturers, but Table 5 gives the sales of mobile loaders and scrapers in the larger states or regions. In 1936, manufacturers report selling 95 mobile loaders of all types to operators in Illinois. Those sales may be compared with a total of 319 machines of similar type in active use in the same state during the year 1935. The largest number of mobile loaders sold in any state went to West Virginia, which also showed the largest proportionate increase over the number actively used the year before. Other areas to which substantial shipments of mobile-type machines were made were Western Pennsylvania, Ohio and Indiana. Sales in smaller volume went to eight other states. Sales of scrapers were consigned largely to areas of special seam conditions where this type of equipment offers particular advantage.

Conveyor Sales, by Regions—Table 6 shows the geographical distribution of sales of conveyors so far as they can be given without disclosing individual business. The manufacturers reported shipments of 660 units to the bituminous coal fields, extending from Maryland westward to Washington and from central Pennsylvania south to Alabama. The largest number sold in any state went to West Virginia, particularly to the southern portion.

The largest single market for conveyors remained the Pennsylvania anthracite region, to which sales of 312 conveyor units were reported in 1936. Most of these where shaker chutes of various types.

TABLE 5.—COMPARISON OF MOBILE LOADERS AND SCRAPERS IN ACTUAL USE IN 1935 WITH SALES REPORTED IN 1936, BY REGIONS

	Mobile loaders		Scrapers	
	In use in 1935	Sales in 1936	In use in 1935	Sales in 1936
Bituminous				
Northern Appalachian States:				
Pennsylvania—Central	...	6	19	2
Pennsylvania—Western	41	82	...	...
Ohio	27		...	...
Southern Appalachian States:				
West Virginia—Northern	6	50	...	...
West Virginia—Southern; and Virginia	33	60	3	5
Alabama	8	9	20	5
Kentucky *		5	4	...
Tennessee		...		1
Middle Western States:				
Illinois	319	95	...	...
Indiana	123	22	...	...
Trans-Mississippi States:				
Colo., Mont., N. Mex., Okla., Utah, Wyo.	100	15	32	6
Total bituminous	657	344	78	19
Anthracite				
Pennsylvania	1	...	507	9
Grand total	658	344	585	28

* Includes sales in east and west Kentucky.

TABLE 6.—COMPARISON OF CONVEYORS IN ACTUAL USE IN 1935 WITH SALES REPORTED IN 1936, BY REGIONS*

	Conveyors in use in 1935†	Sales of conveyors in 1936†
Bituminous		
Northern Appalachian States:		
Pennsylvania—Central, and Maryland	347	44
Pennsylvania—Western		33
Ohio	...	49
Southern Appalachian States:		
West Virginia—Northern	8	32
West Virginia—Southern	63	207
Virginia	44	32
Kentucky	‡15	§36
Alabama and Tennessee	78	55
Middle Western States:		
Illinois and Indiana	12	18
Trans-Mississippi States:		
Ark., Colo., Iowa, Mo., Mont., Okla., Utah, Wash., and Wyo.	282	154
Total bituminous	849	660
Anthracite		
Pennsylvania	1,593	312
Grand total	2,442	972

* The figures of number in use in 1935 are not exactly comparable with the number sold in 1936 because of uncertainties in defining what constitutes a conveyor. The comparison, however, will serve to indicate which regions have made the largest proportionate increases.
† Includes hand-loaded conveyors and conveyors equipped with duckbills or other self-loading heads.
‡ East Kentucky only in 1935.
§ Includes a small number sold for use in western Kentucky.

[1] Allowances for capacity sold in 1936 are based upon the reported number of machines sold during the year and the average tonnage loaded by machines of similar type in 1935, as shown by detailed reports of mine operators to the Bureau of Mines.

[2] Eugene McAuliffe, Mining and Metallurgy, January, 1937, p. 37.

Gold and Silver

(*Continued from page* 39)

It is known that there are few purely silver mines. In fact, 80 per cent of the silver produced in the United States is as a by-product of other metal mines. Forty per cent of the silver produced in the United States is as a by-product of lead mines. Considering the very low price of copper, lead, and zinc, this rise in the price of silver enabled the operation of many lead, zinc, and copper mines that otherwise would have remained idle.

And then these Senators and Congressmen called upon President Roosevelt for his support. It was shown to him that in 1894 the proportion of our silver reserves to our total reserves of gold and silver was 54.9 per cent silver and 45.1 per cent gold. At the time the matter was presented to him the ratio had dropped with regard to such reserves until there was only 14 per cent in silver in such reserves.

The result of such conferences with the President over a period of six weeks was the Silver Act of 1934.

It is contended by Handy & Harman and other metal brokers that the Act has been a failure. Well, we expect such propaganda from speculators in silver. They make their money through the speculation in silver. They wish a free and open market for both gold and silver, without any regulations or control. They are not interested in the stability of money. They make more money when the value of gold and silver is unstable. They clip off a part of the gold and silver both going and coming, and the greater the instability the more they make.

The Government has purchased 936,998,000 ounces of silver under the Silver Act at an average price of 60 cents an ounce. This silver is being coined into silver dollars and is being sold to the banks and the trade and used in the payment of Government debts at a value of $1.29 an ounce. The Government has made a profit of $645,888,420 off the purchase of this silver.

Now, has the circulation of this silver injured our monetary system or our people? It is admitted that it does not constitute any material inflation. It may have added 20 per cent to our circulating media in the form of currency. Certainly this does not mean much, as it is also admitted that 90 per cent of our circulating media consists of bank credits circulated in the form of checks and drafts, bills of exchange, etc. It is through this credit circulating medium that the tremendous inflation occurred in 1929, which was a hundred times greater inflation than the slight increase to our currencies by the issuance of our silver dollars.

Let us see what further the Government has accomplished through the power of the Silver Act of 1934. It has enabled our Government to stabilize the currency of China and place the Chinese dollar on the gold dollar basis of exchange. Our Government bought a quantity of silver from the Chinese Government and gave the Government of China a credit in American dollars for such purchase price. This, of course, was with the understanding that the Government of China would nationalize silver; that is, take all the silver in China it could obtain and place it in the Central Bank of China; that it would make the Central Bank of China the sole bank of currency issue; that it would have behind such currency issue a reserve of 65 per cent; that one-fourth of this reserve should be in silver and three-fourths of it in gold or American dollars. Except for the power of the Silver Act, this could not have been accomplished. Today, China's exchange is stabilized by being tied to the American dollar. It has enabled China again to open its mints and continue the coinage and circulation of silver coins. So China is again substituting for its paper currency silver coins as rapidly as they can be coined and circulated. This is restoring the normal demand for silver in China, and, through the recoinage at a lower metallic silver content, is preventing the exportation of such silver coins from China.

Our Treasury Department has had an understanding with the Government of Mexico whereby the exchange value of the Mexican peso has been stabilized with the American dollar. Silver in Mexico has been nationalized; silver coins are being re-coined at a lower silver content, and are being rapidly circulated through Mexico. In fact, the Government of Mexico, through its central bank has coined and issued over 300 million dollars' worth of silver coins during the past year. This is reestablishing the natural demand for silver. It is possible and practicable for our Treasury Department to aid the Central American and South American republics, if they so desire, in the reestablishment of their monetary systems along similar lines. If this is accomplished, then such countries will again have silver coins as their natural domestic circulation, and the natural demand for silver will be further restored.

In addition to all of this, it ties the money of such countries to the American dollar for exchange purposes. It is a monetary law as well as a commercial law that trade follows such exchange alliances. Great Britain has always been aware of this law. Our Government has just commenced to understand it.

The President has time and time again announced that he is satisfied with both our gold and silver policy, and sees no reason to change such policy.

As I have stated before, the action of our Government in raising the price of gold to $35 an ounce was impelled by the action of other governments. In 1931 Great Britain went off the gold standard. Immediately her currency was depreciated with regard to gold. That is, the pound sterling would not purchase the former amount of gold. In fact, the currency of Great Britain—that is, the pound sterling—was depreciated between 30 and 40 per cent with reference to gold, while gold was, of course, equally appreciated in value. In other words, gold was valued with reference to the pound sterling at various times between $30 and $35 an ounce. Japan and other countries went off the gold standard and depreciated their currencies to even a greater extent with reference to gold, thus greatly enhancing the value of gold with reference to their respective currencies. The United States suffered greatly in its export trade from these depreciations of foreign currencies. Trade was invited to countries of the depreciated currency until our export trade was almost destroyed. It became absolutely necessary for our Government, as a defense measure, to depreciate the dollar with reference to gold, so the United States finally went off the gold standard and depreciated its currency by fixing the gold dollar at $15\frac{5}{21}$ grains of gold. This in effect meant that the gold in our dollar was worth approximately $35 an ounce. So long as our currency remains at its present level, gold must remain at $35 an ounce. We cannot appreciate the value of our currency relative to gold until other countries do likewise. By virtue of a scarcity of gold in other countries of the world, it is hardly likely that the currencies of such countries will be appreciated. In fact, there is a gentlemen's agreement between the United States and Great Britain, France, and other countries, to stabilize their respective currencies at the present value thereof with relation to gold.

This Act has given the United States the power to expand its currency issues and its credit. Such expansion results in the rise in commodity prices.

The indirect benefit of this rise in the price of gold has added to the incentive for the opening up of mines throughout our country containing gold. And, again, it must be remembered that gold is associated in ore with other metals, such as lead, zinc, and copper and such gold content frequently permits the mining of such ores when otherwise they could not be mined. The rise in the price of gold and silver has resulted in the renewed mining operations of many old mines and the opening up of new mines throughout the United States.

The result has been the re-employment of over four hundred thousand men and women in the United States. These men and women were probably on the relief rolls. They are now engaged in natural and valuable occupations. It is contended that the Government is paying the silver miners a bonus, to the extent of the difference in the price of silver in the United States and throughout the rest of the world. Well, this is not a bonus, because the Government makes more out of the silver that it purchases from the American producer than the producer makes. But call it a bonus if you will. The fact remains that it has been the cheapest and the most satisfactory relief measure that has been conceived. The total bonus, if it may be called such, would not exceed fifteen million dollars per annum. This method of relief has been more economical and more satisfactory than any other form of relief.

News and Views

of Interest to Mining Men

Resumes Operation

Tamarack and Custer Mining Company resumed operations the first of this year at its property near Wallace, Idaho. Other big holdings controlled by the Day family, including Dayrock, Sherman Lead and Ambergris in the Coeur d'Alenes and extensive gold properties in the Republic district of Washington, remain closed at the present time with no indication of what is to be done with them. All of these properties have been shut down since the depression. Prior to that time, all ore from the Tamarack and other Day properties in the Coeur d'Alenes, was milled at the Hercules plant at Wallace, owned by the same Day interests. Tamarack ore and any other ore produced by these interests, will be milled there. Coincident with the opening of the Tamarack, the old Tamarack mill on Canyon creek was destroyed by two fires during a blizzard on the night of January 4 and the morning of January 5. The first fire which was believed to have been extinguished, broke out again seven hours later and completed the destruction. The loss was light for the mill had been dismantled.

Metaline District of Idaho

The new mining district, known as The Metaline, in the northeastern corner of the state of Washington, is about 12 miles long, extending from the Canadian boundary line north, up the Pend Oreille river, through the town of Metaline Falls. It is about two miles wide with bulges of greater width. In this district there are two developments of major importance, one, that of the Pend Oreille Mines and Metals Company, and the other the enterprise of the American Zinc Company which has a bond on a controlling interest in Metaline Mining and Leasing Company. The American Zinc Company first spent two years in diamond drilling this property and is now running a mile long tunnel to open the ground at the river level. Both these enterprises are on the west side of the river. On the east side are extensive undeveloped holdings of Metaline Mines Company, controlled by Pend Oreille Mines and Metals Company. On the east side also is the Grandview property. The American Zinc Company has a lease on the Grandview mill. On both sides of the river are extensive holdings of Stephen W. O'Brien of Spokane, some of whose ground will be opened by the American Zinc Company's tunnel. Across the river on the Canadian side, in what is in reality the same district, is the property of the Reeves-McDonald Company, controlled by Pend Oreille Mines and Metals Company. Work was resumed on this property the first of this year. The holdings are so well developed that it can be brought into quick production.

The formation of the Metaline is dolomite overlaid with graphitic slate. The ore is in the dolomite and not far from its contact with the slate. Shipments of the Pend Oreille Mines and Metals Company show the ratio of metals to be five of zinc to one of lead. J. H. Eby, M.E., says most of the croppings have no showings of zinc, as the zinc sulphite is altered easily to zinc sulphate and the sulphate is easily soluble. The ore leached out by rains is left in the dolomite overlaid with graphitic slate. The sulphate which is not easily soluble, and is converted to carbonate, which is not soluble, so the lead remains.

A New Corporation

A new corporation is to be formed under the laws of Delaware to take over the holdings of Polaris Mining and Development Company in the Coeur d'Alenes. A meeting was held January 30, in Wallace, Idaho, to perfect the organization of the new company. By this new set-up the capitalization will be increased from $500,000, divided into 2,000,000 shares, to $750,000, divided into 3,000,000 shares. Assets of the old company will be sold to the Delaware corporation in consideration of the Delaware corporation assuming all of the liabilities of the old company and issuing to the old company stock in the Delaware corporation. The old company then will be dissolved and liquidated by distributing to its shareholders the stock that will be received from the new corporation. Stockholders will receive share for share of stock in the new corporation.

The Polaris Company is indebted to the Hecla Mining Company and to the Newmont Mining Corporation to the amount of nearly $500,000 and it is estimated that the indebtedness will be approximately $600,000 by the time Polaris is well under way as a producing and earning concern.

Wage Demands

Demands for a $7.50 a day minimum wage in the Illinois coal mining industry were asked by the United Mine Workers at their meeting on January 10. This affects properties in Franklin, Saline, Perry and Jackson counties. They also demanded a 6-hour day and a 5-day week, two weeks vacation with pay, a weekly pay day and free coal for miners' families. The final draft of their demands include (1) companies be required to employ at least two men on drilling machines; (2) that all men employed in and around the mine including chemists, laboratory attendants, office help, watchmen, top foremen, boss drivers, motor bosses, head machinists, head carpenters, and head electricians shall be under jurisdiction of the union; (3) tonnage rate to be worked out for all mechanical coal; (4) that all employes on top or bottom be allowed at least two hours pay in case of a breakdown; (5) the elimination of physical examinations; (6) safety lamps be furnished free of charge; (7) that cutting, shooting and loading on night shift be prohibited except in development work; (8) that companies where gaseous conditions exist in mine be required to maintain competent and completely equipped first aid crew; (9) coal companies be required to post bond to protect employes to an extent of four weeks pay; (10) that garnisheeing of wages be prohibited; (11) that next contract be drawn to expire on November 1 instead of March 31. This field now pays a basic wage of $5 a day and works a 7-hour day and 35-hour week.

Profit Sharing

A recent plan was announced by the Idaho Maryland Mines Company of California to share profits with its employes beginning January 1. This involves about 600 employes. The company will set aside funds equal to dividends paid on 150,000 shares of stock which will be distributed among employes based on the length of continuous employment. It is estimated that employes would receive between $80 and $120 on this basis. It is said that this plan is original insofar as the mining industry is concerned.

The Smoke Nuisance

Dr. H. F. Johnstone and Prof. A. D. Singh, both of the faculty of the University of Illinois, recently announced the development of a new engineering technique which they claim will purify smoke-laden air and also open a vast new mineral wealth. They describe their method as "air conditioning a city atmosphere." The process involves what is termed as "scrubbing" and eliminates the three deadly gases chiefly responsible for air poisoning. The successful tests which demonstrated its commercial effectiveness were conducted at the University of Illinois.

Smuggler Union Mine

A new company has taken over the Smuggler Union Mine at Telluride, Colo. This company has produced about $65,000,000 in ore in the past 60 years, and has been operated during the past few years by the Telluride Holding Company. The new company, the Veta Mines Company is headed by R. H. Sayre, Denver Mining Engineer who plans extensive development and an increase in mill capacity to 400 tons daily.

Mine Bonus

Calumet and Hecla Consolidated Copper Company paid a bonus to its men, each for $12.50, in October and December, 1936. Each bonus was the equivalent of a dividend of 25 cents per share on 50 shares.

Trade Practice Conference

A Trade Practice Conference for the wet ground mica manufacturing industry, was held under the auspices of the Federal Trade Commission on January 29. The conference was for the purpose of eliminating practices believed to be unfair and otherwise harmful to the industry and to the public. The Wet Ground Mica Association, Inc. comprises eight companies said to produce about 80 percent of the industry's total output. The product is used principally in paint industries, rubber and wall and coated paper industries. It employs about 100 persons, has an annual sales volume of about $300,000 and a capital investment of approximately $1,000,000.

Hanna Mechanical Mine

According to the *Hanna Coal News* for January, February 1 is set as the date for the practical completion of the latest Hanna Mechanical Mine at Dun Glen. The Tipple, Washing and Cleaning Plant will be finished at that time and full time operation is expected shortly thereafter. The Tipple is being constructed by the Morrow Manufacturing Company and is a four-track, completely mechanized operation. The new mine will be modern in every way from face to the railway cars.

Colored Aluminum

From London comes the interesting note, reported in the press, of a new industry being established whereby aluminum can be dyed in beautiful permanent colors. The American Metal Market reports that the process is entirely new and is electrical. Aluminum treated by this process is said to become insulated against electric current up to 500 volts and will not corrode. The name of the firm making colored aluminum is Anotints Limited.

NEW MEMBER OF STAFF

P. D. McMURRER

The American Mining Congress takes pleasure in announcing the affiliation with its staff of P. D. McMurrer.

Mr. McMurrer has had a wide experience in engineering, mine supervision and safety work. After graduating from the University of West Virginia School of Mines, he spent four years in the bituminous coal fields of West Virginia and Kentucky with the West Virginia Coal & Coke Corporation and the Consolidation Coal Company. He then transferred to the anthracite field, and was three years in the Engineering and Operating Departments of the Philadelphia & Reading Coal & Iron Company. Since 1933 he has been Director of Safety of the West Virginia Department of Mines where he has served with distinction in program for accident prevention and the promotion of safety education.

Mr. McMurrer will be located in the Washington office of the American Mining Congress and his duties will be of a general technical and statistical nature—assisting in the work of the various committees and originating articles for publication.

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Homestake Production Record

Homestake Gold Mining Co., Lead, S. D., yielded more gold in 1936 than in any year in its 60 years of almost continuous operation. This company, the largest producer of gold in the United States, paid $9,041,760 in dividends during the year. To date they have paid dividends amounting to $97,062,202. The Homestake made further progress in 1936 in the sinking of a new shaft and will ultimately reach a depth of 5,000 feet. Total cash returns from bullion and concentrate from 1876 to 1935 were, according to the U. S. Bureau of Mines, $302,001,503 after freight, express, insurance, mint and smelter charges were deducted.

Electrical Progress in 1936

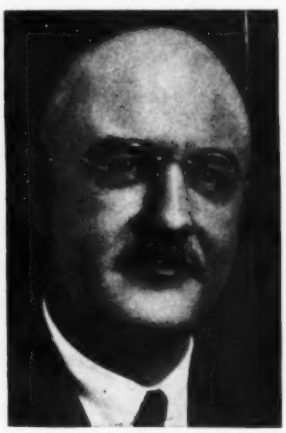
John Liston, General Electric Company, has issued his annual review on Electrical Progress in 1936. In part he said: "Early in 1936 it became evident that a substantial revival was under way in American industries, and this had a stimulating effect on the production of electric apparatus for the modernization of existing plants and the equipping of new plants. The dollar volume of production of industrial type motors was the highest in six years." In a nine-page review he lists many of the outstanding accomplishments of the year in this important industry.

WESTERN DIVISION TO MEET

Oscar N. Friendly

The annual meeting of the Western Division of the American Mining Congress will be held at Salt Lake City, Utah, September 6 to 11, 1937, according to announcements recently made by Howard I. Young, president.

This meeting is held under the auspices of the Western Division, which represents the mineral production of the Western States. Oscar N. Friendly, vice president and general manager, Park Utah Consolidated Mines Co., is chairman of the division. Very shortly, President Young will announce the appointment of the various committees, including chairman of Program Committee and other assignments. Mr. Friendly already has started the local work, and recently announced the appointment of the important local committees which will have charge of the special features of the convention. These include *Chairman of the Committee on Arrangements,* W. J. O'Connor, manager, American Smelting & Refining Co.; *Entertainment,* James Ivers, general manager, Silver King Coalition Mines Co.; *Tours,* J. O. Elton, manager, International Smelting & Refining Co.; *Welcoming,* J. W. Wade, vice president and general manager, Tintic Standard Mining Co.; *Publicity,* G. W. Snyder, vice president, W. S. Snyder & Sons Co.; *Exposition,* J. D. Shilling, assistant to general manager, Utah Copper Co.; *Annual Dinner,* E. A. Hamilton, general manager of mines, U. S. Smelting, Refining & Mining Co.; *Toastmaster,* W. Mont Ferry, vice president and managing director, Silver King Coalition Mines Co. A. G. Mackenzie, secretary of the Utah Chapter of the American Mining Congress, will be general assistant to the committee. Mrs. Oscar N. Friendly will serve as official hostess, and a special ladies' committee will be appointed, with Mrs. A. G. Mackenzie serving as secretary.



A. G. Mackenzie

The convention and exposition will be held at the Minerals Building, State Fair Grounds, and promises to be highly successful from every standpoint. Further details of the meeting will be released shortly by Julian D. Conover, secretary of the American Mining Congress, who plans to make a trip to Western mining districts in the early summer.

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Bituminous Coal Research, Inc.

Among the recent releases by Bituminous Coal Research, Inc. of which John C. Cosgrove is president, are the following: "Resume of Current Research in Coal and Coal Utilization"; Efficiencies and Costs of Various Fuels in Domestic Heating," which is published in cooperation with Battelle Memorial Institute, Columbus, Ohio; "Progress Report on Coal Hydrogenation," published in cooperation with the Pennsylvania State College; "The Relation of the Size of Bituminous Coals to their Performance on Small Underfed Stokers"; "Combustion of Bituminous Coal on the Small Underfed Stoker and Clinker Formation in Small Underfed Stokers." Copies of these reports may be obtained for 25 to 50 cents a copy from Bituminous Coal Research, Inc., Southern Building, Washington, D. C.

Bootleg Coal

Governor George Earle, of Pennsylvania, in his annual address to the state legislature, asked for an end to "economic feudalism" and the "company store" and the "coal bootlegging situation" in the anthracite fields.

Institute Meeting

The 147th meeting of the American Institute of Mining and Metallurgical Engineers will be held in New York February 15 to 18, 1937. Among the important topics to be presented are: Air Transportation; Mineral Industry Education; Mineral Economics; Health and Safety in Mines; Mining Methods; Eastern Magnetite Mining and Milling; Milling Methods; Iron and Steel Division; Institute of Metals Division; Non-ferrous Metallurgy; Coal Division; Petroleum Division; Industrial Minerals; Mining Geology; Geophysical Methods of Prospecting. Many interesting and important papers will be presented to each of the sessions. The meeting will be followed by another Bermuda cruise on the steamer *Queen of Bermuda.* Excellent entertainment has been arranged including a dinner-smoker which will present movies taken at the Mexico City meeting, an informal dinner dance at the Waldorf-Astoria, special and general luncheons and the annual reception and dinner on February 17.

Million Dollar Tunnel

The Utah Copper Company has signed a contract with the Commissioners of Salt Lake County to bore and equip a million-dollar tunnel through West Mountain which will link the towns of Bingham and Copperfield. The tunnel will be 6,998 ft. long, concrete lined, have two traffic lanes and a ramp for pedestrians, also drainage lines.

Freeport Sulphur Makes New Lease

L. M. Williams, Jr., president of the Freeport Sulphur Co., recently announced that his company has signed a lease on a new potential sulphur deposit in Harris County, Texas. Drilling operations will be started within the next two months. It is understood that the lease covers the entire dome area of about 1,800 acres.

National Lead Retires Branch Managers

O. H. Greene, manager of the St. Louis branch of the National Lead Co., after 58 years in the service, retired January 1, 1937. C. C. Foerstner, manager of the Cleveland branch and C. V. Evans, manager of the Gibson and Price Co. branch, are each retiring after some 50 years of service.

Boulder County Mining Association

A. A. Zangara was recently elected president of the Boulder County Mining Association, with the following officers to serve with him: Jack Ingram, vice president; Don Andrew, secretary; J. W. Valentine, treasurer.

Strip Coal Areas Outlined by State Geological Survey

Giving detailed information concerning the location of outcrops, depth of overburden, thickness of coal beds and other fundamental data regarding 28 areas in Illinois that are recommended for examination as sites for stripping operations, Information Circular No. 19, of the State Geological Survey Division of the Department of Registration and Education, will be issued on February 8, together with data maps for each of the areas discussed.

Dr. G. H. Cady, well known throughout the industry as the geologist in charge of coal studies at the Survey, prepared the material, which summarizes investigations that he has recently completed.

The Circular may be secured by operators or others interested by addressing M. M. Leighton, Chief, State Geological Survey, Urbana. The data maps, to be made available in the form of blue line prints, are listed in the Circular, and may be ordered by number, at the cost of blue printing.

Those interested in placing orders to be filled on the day of issuance may on written request secure an advance announcement including the complete map list.

Annual Meeting Colorado Chapter, A. M. C.

Robert S. Palmer, secretary Colorado Chapter, American Mining Company was in charge of arrangements for the annual meeting of the Colorado Mining Association and the Chapter which was held the third week in January. The Convention devoted its discussion to various problems relating to the mining industry generally and specifically to the Colorado Industry. The meeting was called to order January 18 in the auditorium of the Continental Oil Building. The Annual Banquet and Silver Smoker were held at the Brown Palace Hotel on January 18 and the famous Sowbelly Dinner was held at the Cosmopolitan Hotel on January 19. The meeting was a huge success from every standpoint.

Cottrell Awarded Medal

Dr. Frederick Gardner Cottrell, who perfected the process by which the cost of helium gas was reduced from $1,700 to 10 cents a cubic foot, has been chosen to receive the Washington Award for 1937. The announcement was made by the Washington Award Commission. Dr. Cottrell is president of Research Associates, Inc. He is widely known as a chemist and metallurgist. He is the former director of the United States Bureau of Mines. Besides his achievements in the cheap production of helium, he is famous for his work in nitrogen fixation, for his processes of cleaning gases and dust by electrical precipitation and for research in petroleum technology. Dr. Cottrell is the 14th noted American Engineer to receive this Award since it was founded in 1916 by John Watson Alvord of Chicago. The award is administered by the Western Society of Engineers and is made annually. Others who have received the award are Herbert C. Hoover, "for his preeminent service in behalf of the public welfare," and Robert W. Hunt "for his pioneer work in the development of the steel industry."

Operators Debate New Guffey Bill

More than 60 coal operators, representing most of the important coal companies of the country, conferred for several days in January on the recently reintroduced Guffey Coal Control Act. The industry is reported to be still divided, as to the merits of this legislation, into the groups of those who are definitely in favor and those who are definitely opposed, but are willing to entertain further qualifying amendments. The Guffey Bill is known as "Senate Bill No. 1" and is substantially the same as the legislation presented to the last session of Congress. Congressman Vinson, of Kentucky, introduced the new Coal Control Bill in the House, where its number is H. R. 2015.

Company Raises Wages

Anaconda Copper Mining Company raised wages 25 cents per shift effective January 21. This raise is based upon their contract providing for such increase when copper stays at 11½c for 30 days. The advance affects more than 10,000 employes in the properties at Butte, Great Falls and Anaconda. This increase will make the basic wage for miners $5.50 per shift.

Fuel Engineers Meet

Fuel engineers and sales executives of the companies affiliated with Appalachian Coals, Inc., met January 11, for the seventeenth engineers' meeting sponsored by the fuel engineering division of ACI.

The question "What is Coal?" was answered by Dr. Reinhardt Thiessen, research chemist, Pittsburgh Experiment Station, U. S. Bureau of Mines. Dr. Thiessen has been engaged in research work for more than 25 years, studying the origin and constitution of coal.

Papers were presented on two important subjects, "grindability" and "fusibility of ash." J. J. Brennan, research engineer, Northern States Power Company, Minneapolis, discussed "The Fusibility of Coal Ash." R. M. Hardgrove, research engineer, The Babcock & Wilcox Company, New York City, discussed "Grindability of Coal."

Mine Changes Ownership

Negotiations have been completed for acquisition by Republic Steel Corporation of the Mt. Hope coal mine, formerly owned and operated by the Brownsville Coal & Coke Company, Brownsville, Pa. Operation of the mine will be under the general direction of E. B. Winning, manager of Republic Steel Corporation's northern coal mines.

Mining Meeting

The Canadian Institute of Mining and Metallurgy will hold its 38th annual general meeting at Montreal, Canada, March 15 to 17, 1937. Many excellent papers are to be presented which will cover "Stoping Practice at Norenda"; "Accident Prevention at the Sullivan Mine"; "Mining and Milling at Sisco"; "Recent Advances in Coal Cleaning," and many other papers of real interest to the mining man.

Silver Purchase Act

While no administrative action in connection with the silver purchase program is expected in the near future, the first bill providing for repeal of the Silver Purchase Act has made its appearance in Congress.

The bill is H. R. 3,131 introduced by Representative Robert Bacon, (Rep., N. Y.). It provides merely that the present Act for purchase of domestic silver on a proportional basis with gold reserves, shall be repealed. The measure is not expected to get beyond the introduction stage with no action being contemplated in the Ways and Means Committee, to which the bill was referred.—*A. M. C. Bulletin Service.*

Retroactive Silver Profit Tax Valid

The retroactive application of the silver trading profit tax was held valid by the Supreme Court of the United States on January 11. The decision was handed down in an appeal brought by Percy K. Hudson. Mr. Hudson was assessed a 50 percent tax on the profit from transactions in silver which were consummated in May, 1934. The decision reversed that of the Court of Claims which held the tax unconstitutional. The Court ruled that because the tax is not imposed unless there has been a profit over cost and allowed expenses the tax becomes a special income tax.

Hayden Foundation

The bulk of the estate of Charles Hayden, late of Hayden, Stone & Co., (according to his will), will establish the Charles Hayden Foundation for the education of and assistance to needy boys and young men. It is estimated that the estate will total about $50,000,000. Erle V. Daveler, Kennecott Copper Corp., is one of the trustees.

Looking into the shaft of a small part of the coal mine fire that has been burning for 52 years at a cost of $50,000,000 and which Federal forces and money will now try to extinguish. The fire threatens coal fields worth more than a billion dollars. Employing giant steam shovels and heavy charges of dynamite, Uncle Sam's merry men will attempt to douse the fire, backed by $365,000 for WPA labor. Scene is near New Straitsville, Ohio.

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Tenth Annual Mining Institute

The Tenth Annual Mining Institute of the College of Mines, University of Washington, Seattle, was held January 18 to January 23, 1937.

Special features this year were a joint meeting with the American Ceramic Society, at which several interesting papers dealing with the development of industrial minerals and products were presented. Mr. Ross C. Purdy, general secretary, represented the American Ceramic Society. The North Pacific Section, American Institute of Mining and Metallurgical Engineers, met with the Mining Institute on January 21, at which time Prof. Colin G. Fink, head of Division of Electrochemistry, Columbia University, gave an illustrated talk on Industrial Electrochemistry, particularly with reference to the manufacture of electrochemical and electrometallurgical products in the Pacific Northwest. At the luncheon meeting on January 21, the Mines Society presented student speakers in a program devoted to mining subjects.

Special speakers for the Institute are listed below:

Dr. Colin G. Fink, head, Division of Electrochemistry, Columbia University, New York City. "Industrial Electrochemistry."

Ross C. Purdy, general secretary, American Ceramic Society, Columbus, Ohio. "One Hundred and Fifty Years of Ceramics in America."

A. E. Anderson, assistant manager, du Pont Company, Seattle. "Explosives in Prospecting and Mining."

S. H. Ash, safety engineer, U. S. Bureau of Mines, San Francisco, Calif. "Safety and Dividends at Small Mining Operations."

Asa C. Baldwin, civil engineer, Seattle. "Geophysical Prospecting for Gold."

C. V. Brennan, assistant general manager, Britannia Mining & Smelting Co., Britannia Beach, B. C. "High Lights of Operations at Britannia Mine."

H. E. Gray, manager of sales, Bethlehem Steel Co., Seattle. "Steel Manufacture at the Seattle plant of Bethlehem Steel Co."

C. F. Hoff, engineer, Dorr Co., Denver, Colo. "Adventures of a Metallurgist in the Orient."

Ernest N. Patty, vice president-manager, Gold Placers, Inc., Coal Creek, Alaska. "The Airplane Aids Alaskan Mining."

Samuel H. Williston, Portland, Oreg., manager, Horse Heaven Mines, Inc. "Geophysical Prospecting and its Natural Limitations."

Members of the University Staff presented the following topics:

Milnor Roberts. "Mining Events of the Year."

Joseph Daniels. "How to Buy Coal."

C. R. Corey. "Assaying and Production of Metals."

G. E. Goodspeed. "Geology of Industrial Minerals."

J. Grattan O'Bryan. "Interesting Cases in Mining Law."

Student speakers and subjects were:

Gordon Barr. "Sampling at the Tacoma Smelter."

Jack C. Lowry. "Sunset Copper Mine, Index, Wash."

William J. Roberts. "Mining Methods at Alaska Juneau Mine."

The following motion pictures were presented:

The Manufacture and Treatment of Bethlehem Alloy Steels.

Glimpses of Texas—Its Natural Resources, and the Big Bend National Park Project.

Making An All-Steel Automobile Body.

Bituminous Wage Agreement

Representatives of the bituminous coal operators and mine workers of the Appalachian Region will meet at the Biltmore Hotel in New York on February 17 to negotiate a new wage agreement to replace the present contract expiring May 31. In preparation for their meeting with the operators, the mine workers' scale committee will meet at the national headquarters in Washington on Friday, February 12.

Bethlehem Steel Expands

Bethlehem Steel Company recently lighted a third battery of open hearth furnaces in its Lackawanna plant. There are now 43 furnaces in the Buffalo area, 31 of which are operating at about 72 percent capacity. This corporation is in the midst of an investment program of $70,000,000 for new equipment which they believe will improve their markets and increase employment. Eugene Grace, president of the corporation, in commenting upon the company's affairs said, "The past year has been one of encouragement for employes and for the company. The wage rate schedule has been put at a new high level * * * the relationship between management and employes has continued with the same mutual regard and understanding, employes representation plans have never more fully performed as an effective means of collective bargaining."

Institute of Scrap Iron and Steel

The ninth annual convention of the Institute of Scrap Iron and Steel was held at the Netherland Plaza Hotel, Cincinnati, Ohio, January 14 to 16. The best convention in many years was reported by D. S. Luchs, president.

Purchased Rights to Mines Handbook

The *Mines Handbook* established in 1900 and published for years under the name of the *Copper Handbook* and recognized as the authoritative reference on non-ferrous metal mining companies in North and South America, will be continued under the name of *Mines Register*. It will be published by the Atlas Publishing Company, Incorporated, 150 Lafayette Street, New York, publishers of the *Daily Metal Reporter*, which has acquired all rights to the *Mines Handbook*.

The *Mines Register* will not only bring up-to-date all the information contained in Volume XVIII of the *Mines Handbook* (last published in 1931) but will contain other facts and information describing in detail over 7,500 mining companies.

The 1937 edition of the *Mines Register* will contain over 2,000 pages. Work is now progressing on the compilation of this volume which will be ready for distribution about the middle of the current year.

Iron Company Shipments

The Great Northern Iron Ore Company during 1936 shipped 6,698,638 tons of iron ore from their properties, which is 2,000,000 tons more than their 1935 record.

Anthracite Shipments

The total shipment of anthracite for the year 1936 was 46,979,604 net tons, which is approximately 2,000,000 higher than 1935 but about 4½ percent lower than the 1934 tonnage.

Institute Proceedings

The Illinois Mining Institute has just released copies of the proceedings of its summer meeting and its annual meeting. T. J. Thomas, president of the Valier Coal Company, was president of the Institute in 1936 and was succeeded by W. J. Jenkins, president of Consolidated Coal of St. Louis in 1937. B. E. Schonthal is secretary of the Institute. These proceedings contain much valuable information on Illinois Mining methods and practice.

A. S. & R. Increase Wage Scale

American Smelting & Refining Company on January 1 announced a wage increase of 25 cents a day. This brings the wage for skilled workers up to $6.25 a day. Approximately 1,300 men are affected by the raise, which includes both the Garfield and Murray plants at Salt Lake City, Utah.

Carnegie Illinois Labor Plan

According to recent announcements, B. F. Fairless has authorized four steel workers to act as a "little Supreme Court" in settling disputes between the management of the Carnegie Illinois Steel Corporation and its 100,000 employes. This committee is empowered with the unusual right to call mill superintendents and foremen "on the carpet." Mr. Fairless told the committee: "We want to make the employes' representation plan as nearly perfect as possible. We realize that it is not 100 percent perfect but we believe it is the best method of collective bargaining found so far. It requires the proper cooperation of men and management."

New Coal Field Started

Announcement was recently made by the newly formed Roanoke Anthracite Coal Co., that it will start preliminary mining operations immediately for the development of Virginia anthracite coal in the Catawba Creek Valley near Fincastle, Va. It is stated that the coal has been tested and is said to be comparable in quality to the famous Pennsylvania anthracite.

New Mill

On January 15 the Homestead Works of the Carnegie Illinois Steel Corp. celebrated the formal opening and inspection of the new 100-inch semi-continuous plate mill with a dinner which was attended by more than 400 officials. The new mill is completely modern in design and has an annual capacity of 729,000 gross tons.

Interesting Booklet

Appalachian Coals, Inc. is distributing a new booklet entitled, "Which End?" It undertakes to present "a comfortably heated home and full value for every fuel dollar." It also gives helpful hints on smokeless firing by the "alternate method" which they consider the scientific answer to the problem of smoke.

Arc Welding Foundation

One of the richest awards ever established for competition in the field of mechanical science has just been announced by The James F. Lincoln Arc Welding Foundation.

To stimulate intensive study of arc welding, $200,000 will be distributed by the Foundation among winners of 446 separate prizes for papers dealing with this subject as a primary process of manufacture, fabrication or construction in 11 major divisions of industry.

The principal prize winner will receive not less than $13,700. Other prizes range from $7,500 to $100—the latter sum to be awarded each of 178 contestants who receive no other prize, but whose papers are adjudged worthy of honorable mention.

Colorado Fuel Has Large Order

According to Arthur Roeder, president of the Colorado Fuel and Iron Corporation, the company's mill at Pueblo has reopened with large orders on hand and several hundred men have been given employment.

Bituminous Coal Commission And the Budget

No provision was made for the National Bituminous Coal Commission in the tentative budget for the 1937-38 fiscal year. The budget summary, however, does contain the following:

"In view of the adverse decision of the Supreme Court on all but two sections of the Bituminous Coal Conservation Act of 1935, and because the work of the Commission under these two sections will be completed during the current fiscal year, no new provision has been made for the Bituminous Coal Commission or the Consumers' Counsel, for which $990,000 was appropriated" last year.—*A. M. C. Bulletin Service.*

Tri-State Section A. I. M. E.

S. S. Clark, of Miami, Okla., was reelected chairman of the Tri-State section of the American Institute of Mining and Metallurgical Engineers. Other officers were: Ray L. Hallows, vice chairman, and C. L. Williams, secretary and treasurer.

Among interesting reports recently issued by the United States Bureau of Mines are circulars on the following subjects:

MINING METHODS USED IN THE GRUNDY COAL FIELDS OF BUCHANAN COUNTY, VIRGINIA.

SUGGESTED METHODS FOR THE REDUCTION OF MINE ACCIDENTS FROM THE VIEWPOINT OF THE SAFETY ENGINEER.

QUARRYING AND CRUSHING METHODS AND COSTS AT THE PLAINVILLE, CONNECTICUT, TRAP-ROCK QUARRY OF THE NEW HAVEN TRAP-ROCK COMPANY, NEW BRITAIN, CONNECTICUT.

ACTIVE LIST OF PEBMISSIBLE EXPLOSIVES AND BLASTING DEVICES APPROVED PRIOR TO JULY 31, 1936.

OPEN SCHEDULES FOR GOLD AND SILVER ORES AND CONCENTRATES AT WESTERN CUSTOM SMELTERS.

COAL-MINE EXPLOSIONS AND COAL AND METAL-MINE FIRES IN THE UNITED STATES DURING THE FISCAL YEAR ENDED JUNE 30, 1936.

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—*Personals*—

William Taylor, vice president in charge of Sales of the Valley Camp Coal Company, is on vacation in Asia, which includes a steamer trip across the Pacific Ocean.

George S. Rice

George S. Rice, well known mining engineer, who has been affiliated with the United States Bureau of Mines for many years has been relieved of all administrative duties. He will devote all his time to the International Mine Safety Research, Mine Safety Board and special duties.

C. A. Pearse, superintendent of mines for the Carbon Fuel Company in West Virginia, was recently elected president of the Kanawha Valley Mining Institute. Other officers included Carol Robinson, of Kelly's Creek Collieries Company, D. M. Martin, Wyatt Coal Company, C. O. Morris, West Virginia Department of Mines, and W. B. Devaney, of the Cannellton Coal Company.

Hugh S. Johnson, former administrator of N. R. A., was the principal speaker at the annual Sowbelly Dinner of the Colorado Mining Association. Due to bad weather, General Johnson was unable to fly to Denver in time for the dinner and his speech was delivered from Washington, D. C., by long distance telephone.

Jesse F. McDonald, President Downtown Mines Co., was reelected President of the Colorado Mining Association and the Colorado Chapter of the American Mining Congress, at the annual meeting held in January.

Effective February 1, 1937, **James H. Pierce & Company** will be conducted as a partnership under the name of **Pierce Management.**

E. M. Voorhees, vice president of the Johns-Manville Corporation, has been appointed vice chairman of the Finance Committee of the U. S. Steel Corporation. He will assume his new post about April 1.

Colin G. Fink, professor of Electro Chemistry at Columbia University, is on a western trip. He is one of the speakers scheduled to appear at the Mining meeting.

Benj. F. Fairless, president of the Carnegie Illinois Steel Corporation, was guest of honor at the banquet of the Institute of Scrap Iron and Steel.

E. G. Middleton, has been appointed to the position of Advertising Manager for the Joy Manufacturing Company, Franklin, Pa.

S. S. Marshall, Jr., has been appointed general manager of manufacturing operations for the Jones and Laughlin Steel Corporation.

Cornelius F. Kelley, president of the Anaconda Copper Company, was recently appointed chairman of a Committee of Members of the Non-Ferrous Metal Industry which has the responsibility of selling $28,000,000 worth of debenture bonds to finance construction of New York's World's Fair in 1939.

Samuel M. Cassidy has been appointed manager of the Weirton Coal Company and will be located at Isabella, Pa.

Ralph C. Taggart

Ralph C. Taggart, president of the Philadelphia & Reading Coal & Iron Company, is at Miami Beach, Fla., convalescing from a recent illness, from which he is rapidly recuperating. He expects to be at his desk again within the next few weeks.

Alex. B. Hawes has been appointed manager of coke sales for the Wheeling Steel Corporation.

James F. McCarthy, of Wallace, Idaho, was elected Vice President of the Northwest Mining Association.

James Prendergast, president of Susquehanna Collieries Company, is in California for an extended vacation.

Eugene McAuliffe, president of the Union Pacific Coal Company; **Dr. L. E. Young**, vice president, Pittsburgh Coal Company; **Julian D. Conover**, Secretary, American Mining Congress; **John Wellington Finch**, Director, U. S. Bureau of Mines; and **J. H. Hedges, A. C. Fieldner**, and **Dan Harrington**, of the Bureau of Mines staff, attended a special committee meeting of the Advisory Board to the United States Bureau of Mines, at Pittsburgh, on January 14.

T. O. Seiberling has left for Peru where he has accepted a contract with the Northern Peru Mining & Smelting Company.

W. W. J. Crose, head of the U. S. Steel Corporation's Brazilian manganese properties, has returned to South America after an extended business trip to New York.

W. L. Taylor has been elected chairman of the Minnesota Section of the A. I. M. E.

H. S. Salmon, president of Alabama Coals, Inc., was a recent Washington visitor.

C. E. Cowan, vice president of J. H. Weaver & Co., Greensburg, Pa., has has accepted the national chairmanship of the Program Committee for the 14th annual Coal Convention and Exposition of the American Mining Congress, Cincinnati, Ohio, May 17 to 21, 1937.

Hubert Howard, president of the Binkley Coal Company, was recently in Washington in regard to legislation for the coal industry.

Carroll B. Huntress, formerly executive director of the National Coal Association, more recently president of Appalachian Coals, Inc., has been appointed assistant to Executive Vice President **J. Noble Snider**, of The Consolidation Coal Company. He assumed his duties early in January.

C. Murray Campbell has been appointed Assistant Coal Traffic Manager for the Baltimore & Ohio Railroad and **F. M. Jordan** has been named General Coal Freight Agent for this company.

Among the callers at the Washington office of the American Mining Congress during January were the following: **Erskine Ramsay**, Alabama By-Products Corporation; **A. E. Peterman**, Calumet & Hecla Consolidated Copper Company; **J. F. McClelland**, vice president, **Phelps Dodge Corp.**; **Eugene McAuliffe**, president, Union Pacific Coal Company; **John C. Cosgrove, president**, West Virginia Coal & Coke Company; **John A. Robinson**, vice president, Commerce Mining and Royalty Company; **Antonio deP. Arujo**, secretary of the Department of Natural Economics of New Mexico.

H. G. Dalton, senior partner of Pickands Mather & Company, has been elected vice president of the 1937 Great Lakes Exposition in Cleveland. Included in the Executive Committee of 25 are: **T. M, Girdler**, president of the Republic Steel Corporation; **Elton Hoyt, II**, partner of Pickands Mather & Company; **G. M. Humphrey, M. A. Hanna Company**, and **C. F. Blackmer**, president of the American Steel & Wire Company. This is the second year for this exposition. It will open May 29, 1937, and its central theme is "The Making of a Nation." The exposition covers 125 acres and it was estimated that 4,000,000 people attended the 1936 edition.

With the Manufacturer

American Chain Changes Name

American Chain & Cable Company, Inc., is the new name of an old company, known previously as American Chain Company, Inc. In addition to chain and wire rope, many other essential products are manufactured by the following divisions and associates of American Chain & Cable Company, Inc.: American Chain, Andrew C. Campbell; Manley Manufacturing; Page Steel and Wire; Wright Manufacturing; American Cable; Ford Chain Block; Hazard Wire Rope; Highland Iron & Steel; Owen Silent Spring; Reading-Pratt & Cady and Reading Steel Casting.

The directors recently elected W. B. Lashar, chairman of the board; W. T. Morris, president; Wilmot F. Wheeler, executive vice president and treasurer; A. P. Van Schaick, vice president in charge of sales; C. G. Williams, vice president in charge of production; W. M. Wheeler, secretary; Frederick C. Geier, assistant secretary; and Stanley Mann, comptroller.

The general executive offices will remain at Bridgeport, Conn., and 230 Park Avenue, New York City.

New Sales Office Opened

The Brown-Fayro Company, Johnstown, Pa., have opened a new sales office in the Union Building, Charleston, W. Va., in order to better handle their product in the coal fields of that district. O. B. Clark and Murray W. Tuck will represent the company in this district and will handle its complete line, which consists of room and car spotting hoists, layer loading hoists and railroad car re-carters, mine gathering pumps, oil spray systems, mine cars and trucks and other miscellaneous items for use in coal mines. Messrs. Clark and Tuck will also represent the Crocker-Wheeler Electric Company, handling their complete line of electric motors and generators.

Osmose Process

The Osmose Corporation of America, Buffalo, N. Y., has recently issued a booklet describing the Osmose process for wood preservation. Copies of the booklet are available to mine operators by addressing the company at 25 E. Huron Street, Buffalo, N. Y.

Condit Electric

Allis-Chalmers Manufacturing Company, Milwaukee, Wis., announces that its subsidiary company, Condit Electrical Manufacturing Corporation, of Boston, Mass., will be operated as a company unit after January 1, 1937. After that date the plant will be known as Allis-Chalmers Manufacturing Company-Condit Works. The address is 1344 Hyde Park Avenue, Boston, Mass.

The plant will continue to specialize in the manufacture of switchgear products as a division of the electrical department under R. S. Fleshiem, manager. The personnel, with headquarters at Hyde Park, will be as follows: George A. Burnham, assistant manager of the electrical department in charge of sales and engineering of the switchgear division; W. S. Edsall, manager of sales, switchgear division; H. V. Nye, engineer in charge of the switchgear division, with headquarters at Milwaukee. The works organization will be under the direction of Frank W. Young, works manager, and Richard Bechtner, assistant works manager, reporting to Wm. Watson, vice president, at Milwaukee. R. H. Closson will continue as production supervisor. The accounting will be under the direction of Miss A. C. Newhall, reporting to J. A. Keogh, comptroller.

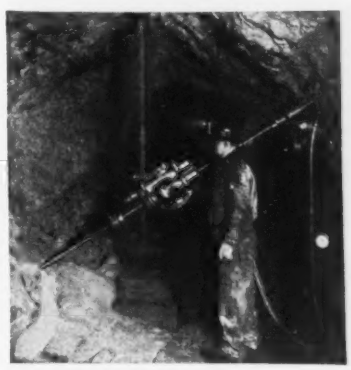
400-Watt Aluminum Reflectors

Aluminum reflectors designed to properly distribute light from the 400-watt high intensity mercury lamp where the mounting height is 18 feet and over, have been announced by the Westinghouse Electric and Manufacturing Company. These units are particularly suited for the general lighting of foundries, machine shops, stamping departments, power plants, receiving and shipping departments and sheet metal departments. The high mounting reflectors are made from 14 gauge commercially pure aluminum sheet. Their shape is such as to make them especially strong and durable after fabrication. A special Mogul type socket is rigidly mounted in the hood to properly position the lamp in the reflector.

New Bulletin

Ingersoll-Rand's latest contribution to the mining field is their new 150-pound drifter—the "DA-35"—which, they state, is "the fastest drill Ingersoll-Rand has ever built," and which they recommend for any heavy drifting job. This extra drilling speed and the drill's low air consumption have been largely achieved by means of a new double-opening, direct-flow valve of small diameter, light weight and short travel. The standard I-R "auto-feed" can be applied to the "DA-35," making it feed automatically in any position, and releasing the drill runner from hand cranking. Bulletin No. 2885 contains pictures and a complete description. Copies may be obtained from Ingersoll-Rand Company, 11 Broadway, New York, or any branch office.

They also announce Bulletin No. 2159-A on the Explorer Diamond Drill. This unit is adaptable for all types of exploratory drilling within its range, either from the surface, or locating or following a vein underground, ahead of winzes, stopes, drifts and cross cuts.



Ingersoll-Rand "Explorer" Diamond Drill.

Announcement

As of December 29, 1936, the assets and business of the Raymond Bros. Impact Pulverizer Company, of Chicago, Ill., formerly a subsidiary of Combustion Engineering Company, Inc., were acquired by the latter company, and the operation of the business previously conducted by Raymond Bros. Impact Pulverizer Company will be continued as Raymond Pulverizer Division Combustion Engineering Company, Inc.

Four-Ampere Unit Added

A new low-current unit has been added to the line of FP-19 automatic oil circuit reclosers, according to an announcement by the General Electric Company. The new recloser has a current rating of four amperes and completes the line which will now operate on currents up to 50 amperes, with voltages from 2200 to 7500.

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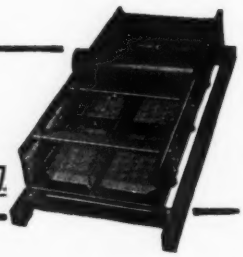

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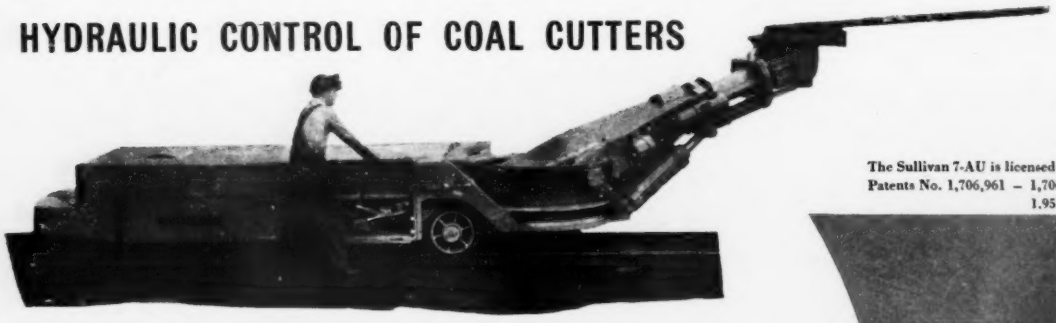

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